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NUARY 23, 1939
LUME 28 NO. 2

AMERICAN DYESTUFF REPORTER

ICIAL PUBLICATION
of the
PROCEEDINGS
RICAN ASSOCIATION
TEXTILE CHEMISTS
AND COLORISTS

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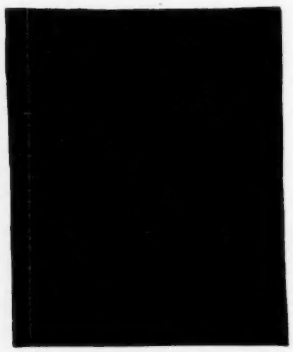
"THIS SUMMER I'M GOING TO KEEP COOL —AND LOOK WELL, TOO!"



Along with the growing popularity of new weaves and fabrics for men's summer wear has come a very natural demand for greater variety in shades and colors. The forecast for this summer points to even brighter, clearer shades than ever before.

And, already our Technical Service Division is helping many dyers match wanted shades, develop new ones. Enabling them to pass on to *their* customers full assurance that dyeings will stand up as they should—in spite of added exposure to perspiration, sunlight, humidity—and even an occasional light shower.

Our long and practical experience with dyes, together with the wide range and flexibility of Calco colors can be valuable to you in meeting the special problems of light-weight fabrics of either natural or synthetic fibres. A phone call or letter to our nearest branch office or our main office will bring a member of our Technical Service Staff to work with you promptly—and without obligation.

For Color in Textiles

Calco

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PROCEEDINGS OF THE

American Association of Textile Chemists and Colorists

JANUARY 23, 1939

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North Carolina State College Student Section

W. L. Carter, Chairman; Seymour Schandler, Secretary.

Philadelphia Textile School Student Section

Newton Monschein, Chairman; Bernard Menin, Secretary.

Members should notify the **Secretary** immediately of all address changes

Proposed By-Laws

FOLLOWING are proposed By-Laws, offered by the Committee on Revision of the Constitution, for revision and adoption by the Council, if and when the proposed new Constitution is adopted. Comments from any member of the Association will be welcome, and if received by the Secretary of the Association in time, will be presented to the Council at its next meeting.

Article 1—Admission

Section 1: Every candidate for Senior or Junior membership in the Association must be sponsored by two Senior members who by signing the application certify the qualifications of the applicant.

Section 2: Every applicant for Student membership must be principally engaged in study, and must be so certified in writing by the Head of the Chemical Department of the educational institution in which he is enrolled. A Student member automatically becomes a Junior member on October thirty-first following termination of his school attendance.

Section 3: A Junior, Associate or Student member desiring transfer to Senior membership must be sponsored by two Senior members in the manner prescribed in Section 1.

Section 4: Every application for membership, accom-

panied by the membership fee, shall be sent to the Secretary of the Association, who shall publish in the official publication of the Association the names of applicants for Senior, Junior, Associate and Student membership, together with their sponsors. Within thirty days after such publication any member may file with the Council a statement of any objection which, in his opinion, exists against an applicant. The Council shall vote on each applicant, and a three-fourths affirmative vote of those present shall be required to elect. Fees of all candidates failing of election shall be returned to them by the Secretary.

Section 5: Election of Honorary members shall be by letter ballot of the Council and must be unanimous.

Article II—Dues

Section 1: The annual dues for membership in each grade shall be:

Senior Member	$5.00
Junior Member	5.00
Associate Member	5.00
Student Member	2.50

Corporate Member—Optional, a minimum of $25.00 being required.

Section 2: Any Senior, Junior or Associate member who pays into the Treasury of the Association the sum of $100.00 in one payment shall be designated a Life member and shall be exempt from any further payment of annual dues. Upon election, a President of the Association shall automatically become a Life Member, exempt from further payment of dues.

Section 3: Any Senior, Junior or Associate member who supports the activities of the Association in any year by the payment of at least $10.00 in addition to the regular dues shall be designated a Sustaining member.

Section 4: The fiscal year of the Association shall begin November first, and all dues shall be payable in advance. A Senior, Junior or Associate member elected after May first shall be credited with $1.50 out of the $5.00 received with his application toward dues in the next fiscal year.

Section 5: A member may not resign in good standing until he has discharged all indebtedness to the Association. Resignation shall be accepted at any time from a member whose dues are fully paid.

Section 6: A member whose dues are in arrears on January first of any year shall have notice sent him, and unless payment be made by February first he shall cease to have any privilege or right in the Association. Such member may however be reinstated by vote of the Council during the fiscal year in which he has been suspended, after full payment of his dues for that year. During a later year a former member may be reinstated by vote of the Council after he has paid current dues and discharged all previous indebtedness to the Association. Current dues plus any indebtedness for dues of a previous fiscal year shall be considered $6.25 for a member applying for reinstatement before May first, or $5.00 after May first, except for a member reinstated as Student, to whom the charge shall be $3.75 before or after May first.

Article III—Duties of Officers

Section 1: The President shall have general supervision of the affairs of the Association, and shall preside, or appoint the presiding officer, at each meeting of the Association or of the Council at which he may be present. He shall call each meeting of the Council, except as provided in the next Section of this Article, through written notice from the Secretary to each member, or during incapacity of the Secretary, through the Treasurer. He shall be ex-officio a member of all committees. He shall be accountable to the Association and the Council for the affairs of the Association, and in accordance with the Constitution and By-Laws and under the direction of the Council, he shall be the chief executive officer of the Association.

Section 2: The President, through written notice to the Secretary, may delegate his duties to either Vice-President. If in the event of his own absence or disability he shall not have so delegated his duties, the Secretary may call a meeting of the Council, which will appoint one of the Vice-Presidents to serve as Acting President until the President himself shall resume his duties or appoint one of the Vice-Presidents to perform them.

Section 3: The Secretary shall be the custodian of the records and printed literature and such properties as the Association may hold for distribution to its membership or the public; and shall perform such duties as may be required by the Constitution and By-Laws or by vote of the Council. He shall receive and record all payments of dues and payments for literature or other properties of the Association, and at frequent intervals or on request of the Treasurer, shall submit to the Treasurer all sums so received. He shall submit at each Council meeting, and at the end of each fiscal year, a classified report of sums so received and transmitted within that fiscal year. He shall prepare and approve all vouchers for expenditures from the Treasury of the Association, and forward them for approval and payment as prescribed in the next section of these By-Laws. The Secretary shall be bonded in an amount considered proper by the Council.

Section 4: The Treasurer shall deposit the funds of the Association as directed by the Council, and shall invest them in such amounts and in such securities as may be ordered from time to time by the Council, provided however that no securities shall be purchased except such as are legal for saving banks in the Commonwealth of Massachusetts. He shall pay all bills and other evidences of indebtedness of the Association after they have been approved in writing by the President and Secretary; except that all expenditures for research shall, in addition, require the written approval of the Chairman of the

Research Committee. His books of accounts shall be open to examination by the Council. He shall render a written report of the financial condition of the Association at each Council meeting, and an annual report after the completion of each fiscal year. The Treasurer shall be bonded in an amount considered proper by the Council.

Article IV—Committees

Section 1: The Chairman of the Research Committee, appointed by the Council as provided in the Constitution, shall himself appoint the other members of his committee. The Council or the President alone may appoint committees with Chairmen, or chairmen with power to select members of their committees, to perform specified duties.

Section 2: Each Standing and special committee, except the Nominating Committee, shall report to the Council in a manner and at a time specified by the Secretary, through proper notice to the Chairman.

Article V—Expulsion of Members

Section 1: A two-thirds affirmative vote of the Council may expel any member of the Association for misuse of the privileges of membership or conduct unbecoming a member.

Article VI—Affiliations with Kindred Interests

Section 1: The Council may arrange affiliations with kindred interests for the purpose of fulfilling the objects of the Constitution.

Article VII—Prizes

Section 1: From the funds of the Association, and in an amount not exceeding $100.00 total in any fiscal year, the Council may offer prizes for the furtherance of the objects of the Association.

Article VIII—Publications

Section 1: All papers presented at general meetings of the Association or at meetings of any of its local sections shall become the property of the Association. Such papers are not to be published elsewhere until they have appeared in the Proceedings of the Association. Material published in the Association Year Book, originating through the activities of the Association, shall not be published elsewhere except by permission of the Council. In publication due credit must, in either case, be given to the Association. Communications to the Association upon subjects of special interest, whether received from members or non-members, may be published in the Proceedings.

Article IX—Privileges

Section 1: Members are privileged to attend all general and sectional meetings, subject only to such fees as may be levied generally to defray the expenses of such meetings. Each member is entitled to receive free of charge a copy of every issue of the Year Book and the American Dyestuff Reporter published within the term of his membership, and to purchase at minimum charge any other publication, standards or apparatus offered for general sale by the Association. The Council may however set a price below the established minimum for sale of Year Books to new members only.

Article X—Sections

Section 1: Sections of the Association shall be local groups of Association members, self-governing insofar as is consistent with the Constitution and By-Laws of the Association. The territorial limits of each Section shall be determined by the Council of the Association and may be changed at its discretion. A member of the Association shall be automatically a member of the Section in the territory of which he has his business headquarters, but at his request the Council may transfer him to another Section.

Section 2: Mode of Formation. Twenty-five or more members residing in any territory may notify the Council of their desire to form a Section. If in the opinion of the Council the formation of such a Section is desirable, the Council shall designate the geographic limitations of the territory and appoint a Secretary pro tem, who shall call a meeting of all members in that territory. This meeting shall decide whether such a local Section shall be formed.

Section 3: Organization of Sections. Each Section shall have a Chairman, a Vice-Chairman, a Secretary and a Treasurer, who with four other members shall constitute its Sectional Committee. All these officers shall be elected annually.

Section 4: Duties of Sectional Officers. The Chairman, or in his absence the Vice-Chairman, shall preside at all meetings. The Chairman may appoint committees other than the Sectional Committee to have charge of special affairs.

Each Section may request through the Secretary of the Association, in any fiscal year, sums not exceeding a total of $1.00 for each Senior, Junior and Associate member in good standing in the Section, with dues to the Association fully paid on May first of that year. On receiving such request, signed by the Chairman and Treasurer of the Section, the Secretary of the Association shall issue a voucher for payment to the Section Treasurer, out of the General Treasury of the Association, as much of the amount requested as is allowable to the Section. The Section Treasurer shall keep a separate record of sums so received and expenditures therefrom; and within one month of the expiration of each annual term of office, shall submit a written report thereon to the Secretary of the Association. This report shall be submitted to the Council at its next meeting, and until it be approved by the Council as showing such expenditures to have been wholly within the purpose of the Constitution and By-

Laws, the Secretary may authorize no further allowance of funds to the Section.

The Secretary of the Section shall submit to the Secretary of the Association a report of each meeting within thirty days of the meeting.

Section 5: Sectional Councilors. Each Section shall be represented in the Council of the Association by at least one Councilor, elected annually to take office on the following January first; and for its total proportionate representation, a Section shall be allowed during the twelve months following each January first, one Councilor for each one hundred and fifty Senior members or fraction thereof in good standing on the May first next preceding said January first.

Article XI—Student Chapters

Section 1: When fifteen or more Student members desire to form a Student Chapter in connection with a textile school or similar educational institution, the Council may upon written application of such members authorize the formation of such a Chapter. Each Student Chapter shall elect each year a Chairman, a Secretary, a Treasurer, and such other officers as it may deem necessary. It may adopt by-laws suited to its needs; but a copy of such by-laws and any amendments thereto must be forwarded to the Secretary of the Association, and shall be subject to approval by the Council. The Secretary of a Student Chapter must send to the Secretary of the Association a report of each meeting within two weeks of the meeting. If it shall appear to the Council that the affairs of any Student Chapter are not being conducted in a manner creditable to the Association, the Council may dissolve such Student Chapter.

Article XII—Dissolution

Section 1: When a Section no longer has a membership of twenty-five or more Senior members or, in the opinion of the Council, fails to maintain the Constitution in its true intent and spirit, the Council by a two-thirds affirmative vote, through letter ballot of its entire membership, may dissolve such Section.

Article XIII—General

Section 1: No Section shall have authority to represent the Association officially, or incur any expense in the name of the Association, except as may be authorized by specific vote of the Council.

Article XIV—Amendments

Section 1: As provided in the Constitution, the Council may amend these By-Laws by a two-thirds affirmative vote of its entire membership. This shall be by letter ballot, after the proposed amendment has been submitted to a meeting of the Council.

The Writing Ink Industry*

CHARLES A. SCHMITT**

WHEN a person writes with a fountain pen, or a steel pen filled with ink, they are using a method of transfering thoughts to paper, which has been in existence for many centuries. It seems probable that the carbon ink of ancient Egypt, about 2500 B. C. was prepared in the form of solid sticks, as in China. Water was added to make a paste, and reed pens were used to write on papyri. Inkstands have been found in the ancient tombs and ruins, about 1600 B. C. containing dried carbon.

Among the Roman antiquities deposited in the British Museum are numerous specimens of the stylus in ivory, bronze, iron, etc., used for writing on the clay tablets. Goose quill pens were invented in the 6th century. They were plucked from the wings of the goose or swan, each wing giving 4-5 good quill pens.

Byron wrote:

"Oh: nature's noblest gift, my gray goose quill.
Slave of my thoughts, obedient to my will,
Torn from thy parent bird to form a pen,
That mighty instrument of little men."

From 1800 to 1835, the number of proposed substitutes for the quill pen were considered. Horn pens, also tortoise shell, and nibs of ruby and diamonds were used set in gold, but these proved too costly for general adoption. The first steel pens in regular use were made by Wise in London, in the year 1803. Williamson a jeweler of New York, made some steel pens in 1800. Joseph Gillott a Sheffield cutler started the manufacture of steel pens in 1822.

The fountain pen first made by Mordant was introduced in 1835. Today there are millions of fountain pens in daily use, gradually replacing the ordinary steel pen. The manufacture of the gold pen for the fountain pen,

*Presented before meeting, Northern New England Section, November 4, 1938.

**Chief Chemist, The Carter's Ink Company.

is a line of work which requires skill and years of experience. To produce a good fountain pen, there are over 50 separate parts, and operations of assembling the hand made and machined units.

So far we have given a brief description and history of the writing pen, and now we will consider the subject of writing ink. The monk Theophilus, who wrote an Encyclopedia of Christian Art in 11th century, described a method of preparing writing ink from thorn wood. An aqueous extract of the wood was evaporated to dryness and the powder mixed with green vitriol. This is probably the earliest reference to an iron-tannin ink.

Albertus Magnus (A.D. 1193-1280) in his treatise "De Rebus Metallicis" also refers to the preparation of an ink from green vitriol. Peter Canneparius, professor of medicine at Venice, in 1660 made black inks from galls and vitriol, and colored inks from various woods and the juices of berry bearing plants.

On the first page of the John Milton's Bible, there is entered in his own handwriting, the record of births of himself and members of his family. One of these, his daughter is May 2, 1652. These appear to be Iron Gall Inks.

In the days when writing was a polite accomplishment, the commercial manufacture of writing ink was not profitable. The careful housewife would rank it among her duties to make ink from her recipe book. Here is one copied from an old English family booklet; Take four ounces of gum arabick, beat small, 2 ounces of gall, beat gross. One ounce of copperas, and a quart of the comings off strong ale/. Put all these together, and stirr them 3 or 4 times a day about 14 days then strein through a cloth.

Another recipe by a Mr. Mason was to take a quart of rain water, put in it 4 ozs. best blue galls, gross by beattin, let stand warm for 3 days, then add 3 ozs. of copperas, 4 ozs. gum allum, shake up 2 or 3 times a day for 3 days. Then put a little Brandy into the ink. The bottlein will hinder it from mouldiness.

In 1609, Guyot invented an Iron Gall ink and sold it in Paris. The earliest scientific investigation of the chemical reactions between iron salts and an infusion of galls appears to be that of Robert Boyle of Oxford in 1663. Other men to carry on this line of work, were Otto Tachen in 1666, then Dr. William Lewis in 1748 and Ribeaucourt in 1792.

August Leonardi of Dresden in 1856 patented an Iron Gall Ink with Alizarine and Indigo as coloring agents. Croc of Paris followed with the use of Aniline dyes in 1861. Prof. Koester of Bonn University wrote to Bismarck in 1879, pointing out the danger of using aniline inks for historical documents, on account of their instability. In the same year the Prussian Government passed a law enacting that only Iron Gall Inks should be used for official business. The State of Massachusetts passed a statute in 1899, regarding specifications for a Standard Record Ink with definite amounts of Tannic and Gallic Acids with Iron Sulphate. Carter has made this ink for over 35 years for our State. The U. S. Bureau of Standards also has similar specifications for the writing ink used in all government records. At this point it may be interesting to state that the Declaration of Independence and The Constitution of the United States were written with an Iron Gall Ink.

One of the largest concerns in the Writing Ink Industry, is The Carter's Ink Company, Cambridge, Massachusetts. This firm was founded by John W. Carter in 1858. Let us visit this modern factory, in which over 300 products are manufactured and sent to 46 countries throughout the world. Here are made 52 different writing inks, used with all kinds of writing and drawing pens, on paper, cloth, leather, rubber, glass, Cellophane, wood and metal products. These inks are divided into 12 groups. Various types of stamping and printing inks are also made for duplicating and addressing machines.

Carbon paper, typewriter ribbons, fountain pens and mechanical pencils are manufactured here and they are all kindred to writing ink, in transferring "the thoughts of man" to paper. An extensive line of adhesives, such as mucilage, liquid and solid pastes, glues, rubber cements, cellophane gums and special brands are made under careful supervision.

We will now start our trip through this splendid equipped and well-organized factory, by going to the fourth floor. Here are the Carter Laboratories, sometimes called "The Heart of the Business." The technical staff consists of a Technical Director, the Chief Chemist and 4 production and research chemists. These men use the latest and best scientific apparatus in their control and investigation work. All raw materials are tested and approved before being used for each manufactured product and these must conform to Carter Standards of quality and superiority. Constant improvement is made, the motto of the Carter Laboratories being, "Nothing so good that it can't be better."

We leave the laboratory, and visit the Ink Manufacturing Department. There are many tanks, some of these contain 5,000 gallons of the Gallo-Tannate of Iron Group of writing inks. These tanks are connected with the bottling tanks on the third floor, and pipe lines run direct to the bottling machines on the second floor. On the west wing of the fourth floor, is the Adhesive Manufacturing Department, where tons of Gum Arabic, Starches, Dextrines and Glues are used daily in the production of Carter Adhesives. Of special interest is a battery of 6-500 Gallon Cookers (copper) where the well known Cico Liquid Paste is made. This product is a laboratory development, the result of four years' research work and 1,376 major experiments. There are also several 1,000 Gallon Copper Tanks where the different types of Muci-

lage are made. Various kinds of cooking kettles of special design are used here.

We now go to the east wing of the fourth floor, where the manufacture of Carbon Papers and Typewriter Ribbons is carried on. Here you will see a large group of Coating Machines, equipped with devices of mechanical precision for uniform coating of carbon paper. The pigment dopes consist of colors, ground with oils and waxes to extremes fineness on large roller mills. The operators of these machines are men of skill and experience, to produce nearly 100 different kinds of typewriter and pencil carbon papers. Here are also the fine adjusted coating machines, that turn out thousands of yards of single and bicolor typewriter ribbons each day. Laboratory control and tests are made on these products during their process of manufacture.

May we go down to the third floor, and here you will see a number of tanks, containing properly aged and filtered writing inks, ready for the bottling machines on the second floor. Also tanks for the group of 25 Poster and Show Card Colors, which are made from pigments ground in large Pebble Mills. These products represent all shades of the Color Spectrum. Going into the Adhesives Room, we see many tanks of Mucilage and Liquid Pastes in the process of seasoning for fixed color and viscosity. Special equipment is used for pumping and filtration operations.

We now visit the east wing on this floor, where we see a large white painted room with special lighting for the operatives. Here are many stacks of various brands of Carbon Paper, which must be carefully examined and approved before they are cut into different sizes and packed in attractive folders and cartons. The large group of young women must have good eyesight and skill in this work. There are accurate length winding and sewing machines that prepare the Typewriter Ribbons made in over 50 different color combinations and ink coatings. All types of ribbons for Multigraph, Adding and Time Clock Machines, also Cash Register Recorders are made in large quantities.

Now we go down to the second floor, and see the bottling department. A visitor is at once impressed by the size of this large room, the hum of the various machines, the variety of products being bottled, labeled and packed according to catalog numbers. The young women are trained groups for their particular work. For instance, there is a rush order for 100 Gross (14,400 bottles) White Writing Ink, 100 Gross of Household Indelible Ink, 100 Gross of Assorted Show Card Colors, and similar orders for Ink Eradicators, Gold and Silver Inks and many other products, speed, skill and accurate work are very important. Of special interest are the array of bottling machines for writing inks, mucilage and liquid pastes. Each one of these fills, caps and labels 21-23,000 bottles a day. At certain times, there are over 100,000 bottles, tubes and packages prepared each day. The automatic machines such as cellophane wrapping, string tieing, tube filling, cap twisting, stamping and labeling are interesting to watch. The manufacture of stamp pads, the assembling work of brushes, glass and rubber droppers, pen holders, rubber handles and caps, drawing ink quills, and many other kindred parts show the amount of detail necessary.

One is impressed with the large amount of equipment required for the production of fountain pens and mechanical pencils. Skilled mechanics work on fine adjusted lathes, borers, grinders, stamping machines and plating apparatus. Proper adjustment of the gold pens and thorough inspection of the finished fountain pens involves much time and labor. Highest quality production, is the aim of this department.

We step into the Clinic Room, and meet The Lady in White, a Graduate Nurse that seved in the World War. She has a supply of various medical products for daily treatments and keeps a health record of over 300 people in the Carter organization. She has a car, visits the homes of sick employees and is a Factory Mother to the many young women.

From here we look at the large and beautiful Lunch Room, for the young women of the factory and office. We now go to the shipping department on the first floor. All orders are made up here, placed on skid platforms to be loaded for the freight trucks, or the cars on the spur railroad track. In the basement are the immense stacks of major Carter Products, packed in all sized cartons, ready for shipments on rush orders. Some of these are groups of 1,000 Gross (144,000 bottles) that are shipped to the chain stores, like Woolworth, Kresge, Grant and others. From these 3 large stock rooms, go the Carter Products to 46 countries throughout the world.

Now we will visit the Power Plant of this factory. The engine and dynamo room is painted in white enamel, the floors are dark blue, everything looks spick and span. The boiler and furnace room with its oil burner equipment is impressive being painted with Aluminum Bronze. Even the engineer and his assistants wear white overalls, while at work.

Now we go upstairs and visit the large main office, where nearly 100 people are busy with the tremendous detail of this business. It is well organized and supervised by a group of junior and senior executives, all trained for their particular line of the work.

We visit the private offices of the management, meeting Mr. Richard B. Carter, President, Mr. George P. Metcalf, Treasurer and Mr. Samuel D. Wonders, General Manager.

You have now completed your visit to the factory of The Carter's Ink Company, with the conviction, that The Writing Ink Industry is the growth of educational advance, scientific development and modern business procedure.

The Role of Starch in Textiles*

J. W. STALLINGS**

HISTORICAL records reveal that starch was extracted from cereal grains at least two thousand years ago. If that was the pioneer beginning, in the years since we have drawn gradually and increasingly from nature's abundant storehouse to fill an International call to the needs of an ever progressing textile industry. Little do we realize the accomplishments through a medium of starch and from a standpoint of economy, until our endeavors fail to supply a supplanting material. By way of mention I may say that it is of importance to the same extent in paper and corrugating, plywood, adhesive and food industries.

PRODUCTS AT HAND

Today at our disposal we have as basic starches corn, wheat, potato, tapioca, sago, rice and others in the process of development such as sweet potato. Various modifications of these starches give us thin boiling starches, dextrines, British gums, glucose, dextrose, various adhesives, and printing gums. Numerous specific conversions are made for individual needs or requirements. The characteristics of different starches vary widely when a comparison is made each to each, and modification products in most cases exhibit much parental character.

PHYSICAL BEHAVIOR

Starch does not possess solubility unless it has been subjected to mechanical, physical, or chemical action. On heating a suspension of starch in water, there is an apparent softening of the outer granule structure, admitting water to swell the inner mass. Initial swelling, paste formation, or gelatinization varies with different starches. The approximate gelatinization temperatures of the commonly used starches are as follows:—Corn 150° F, wheat 142° F, potato 136-142° F, and finest tapioca 137° F. Microscopic examination at a pasting temperature shows a reasonably intact, but well swollen mass. Further heating brings about additional swelling with granule rupture resulting in added body, or increased viscosity. All pure starches reach during an extended cooking period from the initial pasting point a so-called "peak," or maximum viscosity while hot. These temperatures for the commonly used starches are as follows:—Corn 161° F, wheat 185° F, potato 150° F, and tapioca 145° F.

BEHAVIOR OF CONSTITUENT PORTIONS

For many years the concept that starch has two components has been held. The first probable terminology was an outer cell sac and an "inner mass." The cell sac later came to be known as starch cellulose, amylopectin, or alpha amylose. The "inner mass" progressively became granulose, amylose, or beta amylose. (Further reference to components will be made as alpha amylose and beta amylose.) Alpha amylose represents the insoluble portion restricted largely to the wall, while beta amylose is confined largely to the central portion of the granule. There is no definite line of demarcation for evidence supports mixtures of the two. The separation of these portions from different starches yield varied results. The higher alpha amylose percentages are in cereal starches and correspondingly lesser percentages in root starches. The alpha amylose content undoubtedly controls the behavior of starch in the following respects:—

1. Gelatinizing or "pasting" temperature.
2. Opaqueness.
3. Resistance to mechanical, physical or chemical action.
4. Congealing or "jelling."

Starches possessing major portions as beta amylose are more translucent, slower congealing, and do not cool to stiff "jels." Resultant intermediate products and dextrines give quite clear solutions. Potato well exemplifies what has been said.

VARIETY OF CONVERSIONS

Root starches are subject to considerably more action under a given treatment normally applied to a cereal starch. With delicate control it is impossible to produce the variety of modifications from potato chronologically to those of corn. The main purpose embodied in a modification from a base starch is to adapt it more suitably to a specific use. Such products apply to warp sizing as well as finishing and printing gums.

STARCH SELECTION

To select the proper starch, combination of starches, or starch products for a given finish one must have in mind an acquired knowledge of these products, co-working products, and the mechanical "set-up."

Corn starch, thin boiling corn and dextrines are widely used in finishing. Pearl or heavy bodied corn makes up a relatively small percentage of pure finish mixtures, but in backfill mixtures it ranges from fifty to seventy-five per cent of the heavy bodied starches used. Thin boiling corn is better adapted to all pure finishing work where a corn starch is desired. The characteristic "hand" of the corn finish is dry, harsh and boardy. The film is quite opaque and void of luster. For stiffening and filling the harsh-

*Presented at Annual Meeting, Atlanta, Ga., December 3, 1938.
**Stein, Hall & Company, Inc.

ness can largely be overcome by proper softeners and subsequent calendering. On dyed goods, when used, shades are dulled even though goods are uncalendered, but more so if calendered. For mercerized goods requiring maximum luster, corn products should not be used.

Wheat starch, although possessing much of the film opaqueness of corn, is much more desirable where a full, mellow hand is wanted. It takes a longer cooking period for wheat than any other starch, but when properly cooked it is fairly slow congealing. Wheat in mixture with corn provides the best in a backfill mixture.

Potato and tapioca give translucent pastes on cooking and the former is better adapted towards securing the maximum film clearness. The best grade of tapioca is quite suitable for refined finishing work, while the lower grades are unsuitable. Either of the products will give clear films that have a minimum delustering action from a standpoint of the starches. Tapioca and potato conversion products are almost unexcelled for specific work and their solutions are quite clear. Potato and tapioca can be used in pure finishes up to one-half to three-quarters pound to the finished gallon due to the slow congealing properties of same. In backfill finishes they may be used to the extent of fifteen or twenty per cent.

PREPARATION

To get the best results from starch products it is essential that they be properly prepared. In obtaining duplicate results, systematic procedure should be followed. Rule of thumb methods do not often duplicate themselves.

Thick boiling starches should be cooked as near 212° F. as is possible for thirty minutes, thin boiling starches at least fifteen minutes, and dextrines just boiled will be sufficient. Dial thermometers should be used with all cooking equipment. Mixtures of starch and dextrine should be cooked as long as is required by the heavy starch. Backfill mixtures should be cooked until the granules are thoroughly exploded to get best binding of fillers. No definite time can be set, but such mixtures should be checked with a microscope to determine complete preparation. I believe the average cooking time is thirty minutes.

Practically all softening agents, soluble fats, waxes and some metallic salts retard granule disruption during cooking. Sometimes this effect is wanted, but in most cases the maximum degree of starch dispersion is preferred. For some work it proves much better to cook the starch products first and then add the softeners, or other retarding agents. Finishes subsequently sanforized seem to work better with this procedure.

PENETRATION

Penetration of thick boiling starches depends largely upon the viscosity of the mixture (depending upon the starch), the concentration, time cooked, temperature of application, absorptiveness of goods and pressure. If goods absorb water readily, "rapid penetrants" are of no value. Most goods finished from the loom require softeners that have qualities of penetration. Goods dyed from grey stock are usually difficult to penetrate and super wetting agents should be used in conjunction with softeners. Provision for heating mixtures in the mangle box should be provided to assist penetration as well as provide uniform application of heavy mixtures. Thin products can be safely applied without added heat since their body is very slightly increased by a temperature drop.

ALKALINITY AND ACIDITY

Most starch products are neutral to slightly acid in reaction. In order to obtain best finishing results it is of importance that the finishing mixture be approximately neutral. Products apparently neutral, such as softeners or soluble waxes, hydrolyze at times to give a quite alkaline solution. Finishes containing excess alkaline materials tend to be brittle, dull and become discolored on drying. On the other hand, neutral to slightly acid mixtures produce better "whites" as well as colors with more "bloom." If a low pH value is desired a small amount of a mild organic acid such as acetic may be incorporated in a given formula after cooking. The simplicity in practical plant control is available with the pH test papers.

STARCHES FOR SANFORIZING

Thin boiling corn starches of controlled solubility are most suitable for this work. Proper softeners or lubricants are of equal importance, for they must have rewetting properties after being dried in goods, provide "shoe" lubrication, and be able to withstand high temperatures without decomposition, or loss of their effect. Starches and starch products have no degree of lubrication and they are at times condemned as a result of poor or inadequate lubrication. Goods from the loom can be Sanforized if properly lubricated regardless of the warp starch used.

STARCHES IN PRINTING

Untreated or raw starches independently are unsuitable for most printing work. Through proper conversion most any base starch can be rendered suitable for some phase of this work. Combinations can be effected whereby more desirable effects can be produced over a single conversion.

Some few years ago vat colors were the major run of fast colors in printing, and British gums were used in quantity. Today both of these have given up the front seat. Rapidogens, Indigosols, Pharmasols, Algosols, Naphthols, et cetera, have come into prominence requiring much different gums from the soluble British gum. Gums for these colors require:

1. Maximum body with least solid matter.
2. Lowest possible amount of reducing substances.
3. Flow comparative to a British gum solution.
4. Smoothness.
5. Extraordinary color value.
6. Chemical and mechanical stability.
7. Good rinsibility.

To start with, the manufacturer has had the basic starches to model into gums filling the above requirements. The goal is not altogether reached, but worthwhile accomplishments have been made through research work applied to basic materials in manufacture. New products should no longer be looked upon as just another concoction labelled "XYZ Gum," because the development and manufacture of a new gum often progresses slowly.

All printing gums require proper cooking, cooling and storage. Gums of various types differ in the amount of cooking required and the manufacturer in every case can supply the necessary basic information that is required.

Some of the newer printing gums have distinct advantages over older type gums in the following respects:—

1. Minimum cooking time.
2. More body per unit of dry gum.
3. Stabilized body hot or cold.
4. Better color yield.
5. Improved rinsibility.

These gums are better adapted to colors of the Rapidogen and Indigosol types, but are well adapted to improve vat work in conjunction with British gum.

Screen Printing*

RALPH D. GREENE**

MOST of us are familiar with the printing of textiles with the roller printing machines, at least in a general way, but screen printing is something which doesn't ordinarily come to our attention, I think, particularly in this part of the country, as it is not so common, and it is confined largely to smaller shops where there is less publicity and fewer people getting together and exchanging ideas.

Screen printing is, however, becoming more important all the time due to the growing demand for variety in effects produced, and also the recent tendency towards rather small runs in decorative fabrics. The screen printing process has some advantages, which are distinctly seen, over roller printing. In the first place, there is no limit to the size of the repeat which you can obtain. It is possible by roller printing to perhaps print a one or two-color up as far as three or four feet in length, but then the circumference of the roller becomes so large that it is not practical, and furthermore if a large number of colors is desired the machine which would produce, say, a 48 inch repeat in a 16-color design would be a pretty large machine and would not be practical to run, but the screen printing method takes no notice of the number of colors or the size of the repeat. Also, the size of the runs is not important.

For instance, if you could get a large run and set up a printing machine with large rollers, it might be satisfactory to print several thousand yards economically, but screen printing frequently can take care of one or two hundred yards in a 48 inch pattern, probably three or four hundred yards divided up in two or three color combinations. That would take too much time to be worthwhile in a printing machine. On the other hand, the cost of the designs, as far as screen printing is concerned, is very much less. We have no copper to tie up large investments of money, and also the cost of actually making the screen is somewhat less than the familiar engraving expense.

Against this, screen printing is confined largely to what would be known to a machine printer as very large or coarse objects, what a machine printer would call fine is far beyond the reach of the screen. Also, screen printing is fairly slow, small yardage is produced, and the labor cost is considerably higher.

The process itself is quite simple. It is merely an application of the principle of the stencil, with which we are all familiar, only in this case the stencil is made from a woven piece of cloth where the solid parts are painted out, rather than cutting out holes in a solid sheet.

The first step in making the screen is to prepare a wooden frame. This is usually constructed of lightweight lumber such as white pine or other suitable light strong stock. The usual lumber is about one and a half inches by three in the finished form. This is made a little larger than the design, a few inches wider and a few inches longer, the corners put together by means of a mortise, or recess, and then nailed or screwed firmly together. In addition, the corners are usually braced with iron angle brackets such as are easily obtainable in a hardware store, and the whole frame, before anything further is done, is painted with waterproof paint or enamel.

To form the screen for printing, a piece of silk bolting cloth is tacked across the bottom. This material is a very fine, uniformly woven piece of silk which is largely obtained from Switzerland. So far we have been unable to obtain anything equal to it in this country. Some attempts have been made to use very fine cotton fabrics, but so far we have never been able to get anything which would answer the purpose.

This cloth is naturally quite expensive, as I understand it is all hand woven and very carefully made out of the

*Presented at Annual Meeting, Atlanta, Ga., December 3, 1938.
**The Calco Chemical Company.

best silk available and therefore that constitutes one of the considerable portions of the cost of the screen.

This material is stretched across the frame and tacked down securely all the way around. Sometimes an economy may be effected by using a small piece of silk and putting a cotton cloth border on it, but in any case the size of the silk must be slightly greater than the desired design.

On one side of the frame are placed two bolts or screws, or screw-eyes which stick out, and on the top edge of the same side a flat corner bracket is fastened with one leg sticking out from the frame. These are for use, as I will describe later, for determining the position of the frame on the printing table.

The design may be produced on the screen by several methods. The original method consisted of painting the entire pattern by hand. That has been very largely replaced lately by the resist or washout method. By the hand-painting method the designer's painted sketch, which is obtained from the artist, as are most of the designs for printing of all types, must be of full size and carried out all over in detail. This sketch is fastened down on a sample table or tracing table, which is a table about the size of this table here, only it has a rail which is built up on one side, about four inches. The screen which has the blank silk across the bottom is placed over the design. On the rail is a pin or lug, something to move this angle bracket against, to determine the constant position.

After getting the screen in the right position, the operator, who must possess some freehand skill but not be particularly an artist, draws along the silk and outlines a design for each color. The usual material used is India ink which is very satisfactory in a great many ways and holds a straight line on the silk without wandering along the threads. The design may be readily seen through this very, very fine silk bolting cloth. One screen is prepared for each color of the design, and additional colors are also produced by tracing parts of each screen on more than one color, so that an overlay or superimposed print is obtained. This multiplies the number of colors available by combining light shades together far beyond the number of screens used.

If the design is so large that it is not practical to make a screen, for example, a curtain design printed with a border on each end, it is quite common practice to make a set of screens for each half of the design, and so on. After tracing each color on a screen these screens are placed on stands or horses, and the part of the screen where print is not desired is filled in with a flexible lacquer or quick-drying enamel. Naturally this is quite a tedious and expensive process for a complicated design, but the best results are obtained, as far the smoothness of edges and outline are concerned, by painting the design out by hand. The painting is just done around the object itself with the large spaces in between filled in with a large brush.

For finer objects or delicate patterns—when I say "finer objects," let us not be confined to a machine printer's idea of fine objects such as mill engraving and so on—the resist or washout method is used for producing the design. By this process the objects of the design are painted in with a water-soluble ink containing glue, oil or other materials which are not miscible with lacquer or enamel. These are painted inside the ink tracings, that is, the objects which it is desired to reproduce are actually painted instead of being painted around. Sometimes objects may be successfully painted by lifting the screen a slight distance away from the design itself and painting the objects freehand as they go along. This requires a little more skill on the part of the artist but it is very satisfactory for many small objects of the same nature.

When the design is completed the entire screen is covered with enamel or lacquer and allowed to dry, partly. The objects and the unpainted parts of the screen are all painted right over, regardless. After the paint is partly dried the screen is washed with water. That softens up the mixture of glue, oil and so forth, which washes away carrying with it the amount of paint which lies over the surface. By rubbing the surface gently this film is broken off and washed away, leaving the design in clear silk without any paint adhering to it. The screen is then backed up from the other side. That is, the entire side of the screen is painted and then the open portions of the silk are brushed from the reverse side with a cloth which draws the paint out of the open parts and gives it an extra coat on the other side. Then the screen is dried again, turned over and an extra coat put on the first side, so that a complete thorough coating is accomplished.

This may seem a little obscure to many of you but it is a very simple matter, a good deal like wiping water out of a window screen or something of that kind—if you brush it with a cloth it draws the paint right out of the meshes.

There are other methods by which the design has been produced on the screen, notably the photographic method whereby the screen is coated with bichromate and gelatin and the sketch to be produced painted in black and used as a negative. On exposure to light the portions of the gelatin film which are unprotected by this black design are rendered insoluble and the protected design part is washed out, leaving a design in the open portion of the screen. The screen is then reinforced by painting on one side and blotting the excess paint through the open portion, and so on, as in the washout method, until a film of gelatin coated with a film of paint on either side forms the blocking out on the screen. There are also sheets of plastic material which may be obtained. These may be cut out into the desired objects and placed on the screen. The screen is then pressed with a hot iron and these stick on and form the impervious portions, instead of painting them on.

I have a small screen in miniature which I will pass around so that you may see what I have been talking about.

(Continued on page P39)

UNEMPLOYMENT REGISTER

Members of this association, who are without employment, should forward to the secretary a statement as to their qualifications and experience. This information will subsequently appear on these pages with an identifying key number. Employers are also requested to file with the secretary or the American Dyestuff Reporter any vacancies which may occur in their businesses.—H. C. Chapin, Secretary, Lowell Textile Institute, Lowell, Mass.

Key: A—Laboratory and research; B—Dyeing or printing; C—Finishing; D—Sales; E—Instruction; F—Executive.

NOTE: PERSONS WHO HAVE OBTAINED EMPLOYMENT SHOULD NOTIFY THE SECRETARY OR THE AMERICAN DYESTUFF REPORTER AT ONCE.
Prospective employers may file vacancies either with the secretary or the American Dyestuff Reporter.

A-5

Education—Graduate of New Bedford Textile School, three-year chemistry, dyeing and finishing course.

Experience—Tested dyestuffs for all properties; done color matching; analytical laboratory work; made up lacquers and varnishes. Excellent references; will go anywhere; age, 23; single.

A-B-1

Education—Graduate chemist and colorist from a leading textile institute. Speaks French fluently. High standing at school. Awarded 1st prize in chemistry. Member of honor society.

Experience—Knowledge of most processes of textile manufacturing and some experience in woolen and worsted piece and stock dyeing and color matching. Knowledge of finishing. Wishes to get into laboratory or dyehouse.

A-B-7

Education—Evening school in textile dyeing and chemistry.

Experience—Dyehouse laboratory for 2 years. Foreman dyer and finisher on hosiery for 9 years. Experience on ribbons also vat dyes on rayon and silk skeins. 2 years assistant to superintendent. Desires position either in demonstrating and sales or dyer. Age 31; married.

A-B-8

Education—Graduate Chemist.

Experience—Print superintendent, colorist; eleven years' experience in all types of fabrics, specializing on rayon; 8 years' dyestuff laboratory and demonstrating. Excellent references; age 36; married.

A-B-10

Education—2 years of college work and 2 years of chemistry.

Experience—Dyer and foreman of dyehouse for 7 years. Experienced in mercerized cotton, acetate rayon, wool mixed, raw stock, bleaching, beam dyeing. Also laboratory work on dyestuffs, colors and testing. Married; Age 30; References; Will go anywhere.

A-B-C-4

Education—Educated abroad.

Experience—Twenty years experience in the textile field as bleacher, dyer, finisher and chemist. 16 years in charge of dyestuff laboratory of large dyeing plant, 4 years as chief chemist with large bleachery. Has tested dyestuffs, and chemicals used in the textile field and has manufactured soaps and textile specialties. Has handled all textile fibers; bleaching, printing, dyeing and finishing same. Has done pigment and lacquer printing, waterproofing and fireproofing. Reason for leaving last position was due to business conditions.

Age 41; married.

A-B-C-5

Education—High school textile school graduate (textile school of Barman, Germany).

Experience—8 years skein and ribbon dyer; 2 years chemist-colorist laboratory work in Germany. 10 years boss dyer and superintendent for finishing in leading ribbon mill. German; American citizen; married; 40 years of age and willing to go anywhere.

A-B-C-6

Education—English Municipal School of Technology; Board of Education, So. Kensington Chemistry Certificates; City & Guilds of London Institute in Bleaching and Dyeing.

Experience—In U. S. A. 22 years as chemist and chief chemist with one of the largest textile plants in the country; expert colorist; long experience with permanent and semi-permanent finishes. Specialist on vats, naphthols and indigosols. Age 49; married.

A-B-C-7

Education—B.T.C., Lowell Textile Institute, member of honor society; speaks French fluently.

Experience—3 years as textile research chemist in charge of dye house and advisory to purchasing for large Canadian plant. Experienced in woolen and worsted yarn dyeing, for weaving and knitting; raw stock, top dyeing, piece goods dyeing and finishing. Laboratory practice in planning and checking methods and processes, costing and purchasing. 1 year experience as assistant dyer in top dyeing and print works. 1 year as chief chemist in cotton mill in charge of laboratory and control work of vatcolors, naphthols, sulfur and developed colors.

Married; age 28; references; American citizen; will go anywhere; desires opportunity to prove capacity.

A-B-C-D-1

Education—Lowell Textile Institute, Bachelor of Textile Chemistry; Lowell Textile Institute (Evenings), 2 years D. C. Electricity; 2 years A. C. Electricity.

Experience—Six years as chemist and assistant dyer with a large organization. Specialized in dyeing, finishing, bleaching and drying of woolens, worsteds, cottons, rayons and unions in the piece. Some sales experience. Desires position as chemist, dyer, finisher, bleacher or sales. Age 30; American citizen; Married.

A-B-C-E-1

Education—3 years Chemical Engineer major in College, Honor graduate Philadelphia Textile School, Chemistry and Dyeing Course.

Experience—Chemist-Colorist for three years with dyestuff company, Assistant Chief Chemist for 1 year with silk and rayon printing and dyeing plant. Chief Chemist and Director of Research with Cotton Bleaching, Dyeing, Printing & Finishing Plant. Can install Rapidogen system, including construction and necessary equipment, and formulation of standards. Instructor of Textiles and Textile Chemistry, with State Vocational School. Married, age 31, references, will go anywhere.

A-B-C-F-1

Education—Textile institute course; extension work at Brown; executive training with Alexander Hamilton Institute; knowledge of German.

Experience—Dyeing executive in all types of textiles, including stock, yarns, and piece-goods. Thorough knowledge of all classes of dyes and dyestuffs, and their successful practical application in the plant. Wide experience in all types and makes of equipment used in dyeing, bleaching, mercerizing and finishing. Laboratory practice in planning and checking methods and processes, costing and purchasing. Good manager personnel for efficiency and satisfactory results economically obtained. Cotton, rayon and silk, some acetate rayon, and mixed fabrics. Excellent references; in excellent health.

A-B-C-F-2

Education—Lowell Textile Institute, 1911.

Experience—26 years in cotton yarn and piece goods finishing plants; expert on naphthols, vats and other cotton and rayon dyeing; all types of control work and testing; analytical processes; purchasing of dyes and chemicals. Age 46; excellent references; in perfect health; will go anywhere; married.

A-B-D-1

Education—Randolph Macon College; Facett (Art major, design and chemistry).

Experience—2 years in dry color house as colorist, control and technical sales; 2 years with paint manufacturing laboratory control and plant work; 2½ years with dyestuff manufacturer on technical sales, research on organic pigments, paper dyeing and textile colorist on directs, acids, and printing. Interested in position as technician and sales with color laboratory.

A-B-F-1

Education—Technical School. Dyeing and Chemistry.

Experience—Mill chemist. Dyer: yarns, tops and rawstock; wool, cotton and rayon. Vigoreaux printing. Bleaching. Would like position as dyer, chemist or demonstrator. Business conditions reason for leaving last position. Excellent references. Age 45.

B-3

Experience—Foreman piece dyer for the past 21 years. Can dye the following: rayon, cotton backs, wool, silk and mixed fabrics. Has knowledge of finishing and laboratory work.

B-4

Experience—Foreman dyer in charge of ribbon dyeing for 20 years. Experienced on silk, cotton, rayon, acetate yarn. Age 41; will go anywhere.

B-5

Education—High School and Textile School Graduate.

Experience—Twelve years overseer of dyeing on directs, vats, naphthols, sulfur, basic and developed colors. Also experienced bleacher. Age 40; married; references.

B-6

Education—Textile School Graduate.

Experience—Former instructor in chemistry and dyeing. Twelve years' experience as overseer of dyeing of vats, naphthols, developed, indigosols, sulfur and direct colors on piece goods. Age 35; excellent references.

B-C-1

Experience—20 years experience in dyeing and finishing departments; 15 months as general superintendent of well known woolen mill. Capable of handling dyeing alone or in combination as superintendent of dyeing and finishing.

Age 40; references.

B-C-2

Experience—12 years foreman piece dyer on vats (pigment), naphthols, soluble vats, sulfurs, developed, basics and directs. Pads, jigs, boxes and continuous machines. All constructions of cottons and rayons. Full practical knowledge of bleaching, mercerizing, and working knowledge of most finishes and finishing machinery. Could take charge of entire wet processing.

Age 38; married; references.

B-C-3

Education—Graduate, Philadelphia Textile School; speaks German fluently.

Experience—Employed at velvet company for 7½ years. Past 2 years working in finishing department on regular, waterproof and crush-resistant finishes (resin finishes). Can take charge of finishing of velvets. Have some piece dyeing experience.

29 years of age; married; will go anywhere.

B-D-1

Education—Received early training in England and attended technical college there.

Experience—Dyeing executive; all types of ladies and men's hosiery and all types of textiles including stock, yarns, piece goods and government uniforms; woolen and worsted suitings; cotton, silk and rayon on yarns, piece goods and mixed fabrics; thorough knowledge of all types of dyes, successful application of same and laboratory work. Fourteen years with one employer; business conditions reason for unemployment.

Age 52; married; English American; sober and reliable. Desires position as dyer or demonstrator and service man for dye company.

F-1

Education—Two years high school; 6 years evening engineering school; 1 year evening textile school; 1 year industrial management; course in accounting.

Experience—Ten years in an executive capacity in full fashioned hosiery manufacturing business. Familiar with entire manufacturing procedure, finishing dept., dyehouse and office. Specialized in finishing dept. and has good eye for color, finish and quality. Had responsibility of all orders going through mill, stock, grey goods and traffic. Five months in New York sales office. Gets along well with people and contact with employees and customers has always been satisfactory. Previous to hosiery experience was in a mechanical business for 17 years.

43 years of age; single, in good health; will go anywhere.

Textile Chemical Specialties

THE following list of Textile Chemical Specialties was inadvertently omitted from the 1938 Year Book. We are therefore publishing them at this time, and in such a manner as to be valuable for further reference in connection with the Year Book. The key to names of manufacturers is as follows:

AC&C—American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.

Ciba—Ciba Co., Inc., Greenwich and Morton Sts., P. O. Box 25, Station C, New York, N. Y.

W—Wallerstein Co., Inc., 180 Madison Ave., New York, N. Y.

Mfr.	*Name*	*Use*	*Chemical Nature*
Ciba	Sapamine MS	Cation-active fixing agent for direct dyes. Levelling agent for basic dyes. Emulsifier	Quaternary salt
Ciba	Silvatol I	Local detergent for grease and tar and for dry-cleaning	Pine oil compound
Ciba	Silvatol II	Local detergent	Pine oil compound
Ciba	Solvadine NC	Wetting-out agent, active in either neutral, acid or alkaline solutions	Alkylated organic sulfonate
Ciba	Ultravon K	Detergent of neutral reaction, stable to lime salts, boiling caustic soda solutions and dispersing agent for lime soap	Sulfonate of complex stearyl-alkyl compound
Ciba	Ultravon W	Detergent of neutral reaction, stable to lime and magnesium salts, boiling caustic alkalies or acid solutions	Sulfonate of complex stearyl-alkyl compound
Ciba	Cibanaphthol RF	Prepare; developer	Beta-hydroxy-naphthoic acid anilide
Ciba	Cibanaphthol RA	Prepare; developer	Beta-hydroxy-naphthoic acid beta-naphthalide
Ciba	Cibanaphthol RN	Prepare; developer	Beta-hydroxy-naphthoic acid alpha-naphthalide

American Association of Textile Chemists and Colorists

Mfr.	*Name*	*Use*	*Chemical Nature*
Ciba	Cibanaphthol RBL	Prepare; developer	Beta-hydroxy-naphthoic acid para-aniside
Ciba	Cibanaphthol RM	Prepare; developer	Beta-hydroxy-naphthoic acid meta-nitro-anilide
Ciba	Cibanaphthol RTO	Prepare; developer	Beta-hydroxy-naphthoic acid ortho-toluide
Ciba	Cibanaphthol RCT	Prepare; developer	Beta-hydroxy-naphthoic acid 5-chloro-toluide
Ciba	Cibanaphthol RC	Prepare; developer	(Composition not available)
Ciba	Cibanaphthol RK	Prepare; developer	(Composition not available)
Ciba	Cibanaphthol RT	Prepare; developer	(Composition not available)
Ciba	Cibanaphthol RPH	Prepare; developer	(Composition not available)
Ciba	Cibanaphthol SB	Prepare; developer	(Composition not available)
Ciba	Cibanaphthol SD	Prepare; developer	(Composition not available)
Ciba	Cibanaphthol ST	Prepare; developer	(Composition not available)
Ciba	Orange Ciba II	Base or salt	Ortho-nitraniline
Ciba	Orange Ciba IV	Base or salt	Meta-chlor-aniline
Ciba	Scarlet Ciba I	Base or salt	2-5-di-chlor-aniline
Ciba	Scarlet Ciba II	Base or salt	4-nitro-2-amino-toluene
Ciba	Red Ciba I	Base or salt	4-chloro-1-2-anisidine

Mfr.	*Name*	*Use*	*Chemical Nature*
Ciba	Red Ciba V	Base or salt	5-nitro-2-amino-anisole
Ciba	Red Ciba VI	Base or salt	4-chloro-2-nitraniline
Ciba	Red Ciba VII	Base or salt	3-nitro-4-amino-toluene
Ciba	Red Ciba IX	Base or salt	5-chloro-2-amino-toluene
Ciba	Brown Ciba III*	Base or salt	Chloranisidine
Ciba	Brown Ciba IV*	Base or salt	Meta-nitro-ortho-anisidine
Ciba	Scarlet Ciba R	Base or salt	(Patented, composition not available)
Ciba	Scarlet Ciba IV	Base or salt	(Patented, composition not available)
Ciba	Scarlet Ciba V	Base or salt	(Patented, composition not available)
Ciba	Red Ciba VIII	Base only	(Patented, composition not available)
Ciba	Bordeaux Ciba II	Base or salt	Ortho-amino-azo-toluene
Ciba	Bordeaux Ciba III.....	Salt only	(Patented, composition not available)
Ciba	Bordeaux Ciba IV	Base or salt	3-nitro-1-4-anisidine
Ciba	Violet Ciba III.....	Base or salt	(Patented, composition not available)
Ciba	Brown Ciba I	Base or salt	(Patented, composition not available)
Ciba	Brown Ciba II	Base or salt	(Patented, composition not available)
W	Serizyme	Desizing acetate rayon fabrics and others containing protein sizing. Also used in patented process in the treatment of raw silk to facilitate subsequent degumming	Proteolytic enzyme

*Brown bases for use only with Cibanaphthols SB, SD and ST.

Mfr.	*Name*	*Use*	*Chemical Nature*
AC&C	Sodium Tetra Phosphate..	Water softener; assistant in bleaching, scouring and dyeing. (Manufactured by Rumford Chemical Works)	$Na_6P_4O_{13}$
Ciba	Albatex PO	Levelling, penetrating or stripping assistant for vat, direct and dispersion dyestuffs, also softener	Sulfonate of a complex stearyl-alkyl compound
Ciba	Albatex O	Mordant and fixing agent for basic dyestuffs	Phenolic condensate
Ciba	Albatex WS	Reserve for silk and wool, in union dyeing	Phenolic condensate
Ciba	Invadine B	Wetting agent, resistant to chlorine bleach baths	Sodium alkyl-phenylene sulfonate
Ciba	Invadine C	Wetting agent, active in acid carbonizing baths	Sodium alkyl-phenylene sulfonate
Ciba	Lyofix DE	Cation active fixing agent for direct dyes. Levelling agent for basic dyes	Quaternary salt of an organic base; range of $C_{12}H_{26}$ or higher
Ciba	Neolan Salt II.....	Assistant for dyeing Neolan dyes	Quaternary salt of an organic base; range of $C_{12}H_{25}$ or higher
Ciba	Sapamine FL	Softening agent for use in the dye-bath of direct colors and in the padding mangle	Sulfonate of complex octo-decyl-alkyl comp.
Ciba	Sapamine KW	Cation-active fixing agent for direct dyes. Levelling agent for basic dyes. Substantive softening agent	Quaternary salt of an organic base; range of $C_{12}H_{26}$ or higher

Screen Printing

(Continued from page P38)

This is done by the hand painted method and illustrates in a small way what the thing is really all about.

The printing operation is carried out on long tables of suitable dimensions. They are built of either wood or metal, of rigid construction, usually about thirty inches high and about six inches wider than the widest material that we expect to print. The length of course depends upon the amount of floor space available. A fifty-yard table is very good for ordinary production, but a longer table naturally is more efficient. The table is fitted with a guide rail about four inches high along one side. This is readily accomplished in the metal construction by using the four inch angle iron for one side of the table, and pointing the angle iron up. This is only done on one side. On wood constructed tables a board is simply bolted up right along the edge of the table.

The tops and the inner surface of the guide rails must be very carefully trued and leveled in order to obtain perfect register. The surface of the table is covered then with a cushion of half or three-quarters inch felt to provide a spongy blanket on which to do the printing. Over that is placed a covering of table oilcloth or similar material. If it is not felt that oilcloth is going to be required a simple application of one or two layers of back grays will be satisfactory. These are tacked or clamped down smoothly and securely over the whole surface of the table.

The whole surface of the table must be very smooth and level. Any wrinkles, kinks, sagging places or dents will produce an inferior print as there is no great amount of pressure applied. So we depend more upon the smoothness and trueness of the surface than anything else.

In some places heat has been placed under the table so that in spite of this protective layer of felt quite a noticeably higher temperature is obtained on the cloth than would otherwise be obtained. Also, various methods of blowing air, both hot and cold air, have been experimented with and have worked very satisfactorily. Ordinary fans of the household type, sometimes mounted on brackets, have blown towards the tables; some have air conveyor tubes over the tables—and there are a great many varieties—in order to accelerate drying. Over the top of the table for each design is placed a back gray. These are changed as frequently as it is found necessary due to the nature and weight of the goods, the character of design, and so forth.

These loose pieces of grays which are not a part of the permanent construction are fastened down with pins; ordinary flat-headed or common pins may be used. These are pushed in at an angle towards the center of the table. The gray is smoothed out, the pin is shoved in in a diagonal direction towards the center of the table.

The pieces to be printed are then stretched over the table lengthwise by means of some sort of ratchet or roll device to get lengthwise tension, and then are pulled out by hand and pinned down into place with pins according to the same method. These pieces must naturally be carefully tentered to insure uniform borders as the printing does not go entirely to the selvage on each side for the reason that printing over the heads of the pins is injurious to the screen. Sometimes if it is desired to print over the entire selvage the piece is pasted down onto the grays. This is accomplished by brushing on some glue or other adhesive material and rolling the piece down until it is firmly attached. When the color is applied the glue is softened and the piece is readily removed.

When the pieces are ready for printing the first screen is placed on the table and those two screw-eyes or bolts, or whatever is used on the edge, are brought up against the inner edge of this rail, on the side of the table. In the case of a wooden table the upper edge of the rail is fitted with a nail. It is just driven into the upper edge part way. On an iron table a slotted block or a lug secured by a set screw is used. One of these is placed against the angle iron leg which projects over the top of the guide rail. The size of the repeat is then very carefully measured and another lug placed along the table at that distance. And so on down the table, one lug for each repeat, so that the screen may be placed in such a position that the design will be continuous. A gauge of some sort is very useful for this, but it can be done by simply measuring.

On the wooden tables the common practice is simply to have a stick the proper length with a notch in each end and the nail is just driven in on one end and then on the other, the stick moves along, and so forth. Some sort of a sliding metal gauge is more desirable for the angle iron railing. The importance of the lugs naturally is easily seen because if a mistake is made in spacing these lugs there will be a gap between the repeats.

Inside the screen then is placed a scraper or a squeegee with which to do the printing. I have a small one here which fits that screen you have seen. It is just a piece of wood, as long as necessary, tapered down on each side to a fairly sharp edge. There are various kinds of scrapers used. Some of them have a rubber face, and some of them have a strip of rubber placed edgewise in the board. It doesn't make a great deal of difference what you use as long as you know how to use it properly. Some shops use rubber edged scrapers entirely, some use wooden edge

scrapers entirely, some use both, and other varieties. The main thing is the principle of the edge of the scraper: the sharper the edge, the sharper the print obtainable, where the color is cut off at the edge of the stencil.

On the other hand, where a heavy fabric is used and penetration is desired, a blunter edged scraper will force more color through the meshes and onto the cloth, but will not make such a sharp outline.

The printing color is then poured into the screen along the length of the screen behind the scraper, and the printer is ready to start. The operator places the scraper behind the color then and pushes the color ahead of the scraper, all the way across the screen to the far side. In this way he passes over the open objects on the stencil and ends up at a clear space at the other end where there is no design. He then lifts the scraper and brings the color back toward him. This operation is repeated as often as is necessary to produce a satisfactory print.

He exerts sufficient downward pressure to clean the screen with each pressure, also to force the color to some extent into the cloth. After he has scraped the required number of times which is determined by the absorbency of the cloth, the character of the design, the nature of the color, and other important factors, the scraper is laid against the nearer side of the screen, the screen is lifted up, and carried along to the next lug on the table. He puts the two screws against the rail and the angle bracket leg against the lug and then lowers the screen down to the table in printing position. He then repeats the same operation of scraping color back and forth, and so on, along the entire table. As he needs more color he adds it from a pail or pitcher which is carried along and set under the table.

At the end of the table or tables, as the case may be, the screen is washed off with a garden hose and stood on edge to dry off until it is required again. A second color is then applied in a similar manner with the second screen, and so on, until the pattern is complete. A second printer may start before the first one has completed the table; but he must wait long enough for the first color to be absorbed enough to avoid smearing. He does not have to wait until the color is entirely dry but only long enough so that a blotting action will not take place.

The rotation of the colors is determined in advance with this in mind and particularly in regard to the overlays and contact between adjoining colors so that there is no time lost waiting for any drying to take place. As the printing of a hundred yards, which is usually taken, may be fifteen or twenty minutes, this is not very often the case and several printers may work on the same pattern following each other around. The design is continued from one table setting to the next by marking the position of the last repeat on the table and then moving the cloth along and adjusting the first repeat to fit where the last one leaves off, so that the design is continued from one table to the next.

After printing the printed pieces are removed from the table by taking out the pins, drawn along the table and hung up, festooned on racks at the end of the table to allow the drying to be completed, and then removed for steaming, washing, and other finishing operations.

The effects obtained by screen printing are striking in many instances and extremely variable. As I mentioned before, the length of the repeat is not limited, as is the case in roller printing, and the effects obtainable by overprints and resist prints multiply the number of shades, particularly useful in drapery work where a large number of color and soft blending effects are desired.

The size of the run naturally is not particularly important as it only takes a few minutes to pick out a new set of screens from the storage racks and very few more minutes to set up the table by just changing the position of these lugs for the repeat. In that way a great many different patterns may be printed in the same day. The size of the runs does not concern the screen printer particularly. Of course he likes to have as much as he can but it is not always available. For this reason many of the patterns which are perfectly well adaptable to machine printing have been printed by screen printing simply because the machine printers don't want to touch such a small volume. Also, the screen being less expensive than either copper rollers or the engraving of rollers, many new styles are tried out in a small way. Screens are produced for small yardage, sufficient for trial lots or sampling material. If it turns out the design is going to be a big number then it may be transferred to the machine printing rollers later for volume production.

However, the most successful screen printers have depended rather more on novelty work than they have on a large quantity of anything. Most of the screen printers are small concerns which are operated by an individual who has, himself, some creative ability, and he is often in the position of making suggestions to his customers, rather than taking his orders or reproducing designs which the customer has himself obtained. The screen printer naturally comes across certain things which he finds he can do that the customer does not know about, and by making a suggestion, may very often lead his customers to a profitable bit of business.

I have illustrations of some work with me. These are just rough patches which I have accumulated at various times. I brought two or three along to show you just what can be obtained. This one here represents what has been done to a large extent in drapery work. You can readily see, if you are familiar with machine printing, that that would be quite a proposition to a machine printer to tackle. The repeat is about forty inches, the number of colors, I think, is twelve or fourteen. It also has on it a resist print which obtains more than one tone with several other colors. It also has several overlays where compound shades are made in the printing. So that altogether that would be quite a proposition for a machine printer to

tackle. For a screen printer it is a cinch. He does it every day.

However, even if you could put up a machine which would produce that economically, in spite of the short runs involved and the number of colors and the size of the machine, you still have larger repeats which have shown themselves very much recently in the table cloth business. Such a design as that is somewhat difficult for a machine printer. The screen printing process has produced a tremendous amount of table cloth in recent years, and also, as they go along right on the end here, they can print a set of napkins, which makes a repeat four or five more feet long.

A third thing which went very well a few years ago was the shower curtain. For instance, you could print a forty or forty-five inch repeat successfully—here is a six-foot one in a shower curtain, which is of course considerably beyond the machine printer's reach in any circumstance. We actually printed some seven and eight-feet shower curtains for special purposes where the archway or the opening was extra long, on special order. That would take quite a printing roller,

I will be glad to circulate any of these around if anyone is interested in looking at them. Bear in mind, they are only rough patches. Don't criticize anything except the general effect.

DISCUSSION

Mr. Smith: How many colors were there in that first piece you showed?

Mr. Greene: I do not recall, but I think there were twelve screens used. The actual shades produced numbered in excess of thirty, by the overlays and white colors combined. This was a particularly cut down design as there is not a separate screen for light and dark shades of the same color. That is accomplished by printing a single screen under all those colors in part so that a resist is formed where you get a light and a dark print of the same color. That is done in plain applications.

Mr. Frey: What type of lacquer would you recommend for blocking out the resist?

Mr. Greene: There are several manufacturers of lacquer who furnish products that are perfectly suitable for that. I don't recall the exact names at the moment, but there are several manufacturers who furnish screen printing supplies of all kinds, particularly in New York. There is a large amount of this type of work done in that vicinity. If you desire to obtain any information about that you can get in touch with any of those suppliers. They will probably have several kinds and can recommend something for you.

Mr. Frey: It is very important that you get the right type of lacquer, I presume, in order to resist the strong alkalis, isn't it?

Mr. Greene: Yes. Of course you do not print with a strong alkali on a silk screen. That is one limitation of the screen printing. You will not be able to print krinkle effects, or things of that nature with concentrated caustic. Of course silk can stand a moderate amount, such as may be used in printing color.

Mr. Frey: In other words, it would be advisable to get alkaline resistant lacquers, then?

Mr. Greene: The lacquer of course depends somewhat on the nature of the color, but in general a fairly high solid content lacquer for clear or fairly well pigmented paint would be all right. The main thing there is the flexibility. The passage of the scraper back and forth across the screen produces a continuous little bending, and a brittle lacquer would not work. It would crack.

Mr. Frey: If you used a nitrated lacquer, a nitrocellulose lacquer, your caustic would break it down, wouldn't it?

Mr. Greene: The amount of caustic is usually fairly small. I don't anticipate any damage on an ordinary cotton lacquer.

Mr. Frey: I imagine you will on nitrates.

Mr. Greene: We had a good many screens made with cotton nitrate lacquers which we used for printing of colors which are printed in a mildly alkaline medium, and we did not notice any difficulty as far as destruction of the frames were concerned.

Mr. Frey: Did you get choppy edges?

Mr. Greene: Not if the screen was carefully made and well painted. Of course they may be repaired at any time if they tend to break away. There is a greater danger in solvents than there is in alkali, I believe.

Mr. Frey: In acetates I agree with you, but not nitrates.

Mr. Greene: That perhaps is a rather fine point that would have to be determined individually by the printer himself as he goes along. Of course, there are screens made by which printing is done with lacquers. Then of course the screen itself is not made with the lacquer or paint, but is made with the gelatin, or other solvent-proof material. Of course those are not so good for water type colors.

Mr. Smith: What type of color is used there?

Mr. Greene: This particular design is produced with chrome printing colors. I think most types of colors that are suitable for printing are adaptable to screen printing.

The Dyeing of Naphtols

on Cotton Piece Goods by the Continuous Hot Flue Method*

SUMNER H. WILLIAMS**

IT has been my privilege during the past ten years to work with the dyers of the South in assisting them with the latest developments for producing better results in the dyeing of Naphtols on cotton piece goods. Considerable improvements have been made, and credit for this progress is due to the many dyers and plants who were willing to take the initiative in advancing the art of dyeing in this particular field.

Naphtols, as a group, lend themselves to the continuous method of dyeing, and fabrics that can be processed in this manner are best dyed on continuous equipment. The success of this procedure depends on the control a dyer has over the various factors that fluctuate during the run.

As important as the technicalities of the colors and combinations is the proper mechanical set-up of suitable equipment. By revealing the achievements that have taken place in this field, we hope to be able to give you a few points that will aid in the control of the various steps for producing the best results.

There are four very important operations connected with this form of dyeing, and concerning each operation new developments in the mechanical set-up have proved effective in bringing about added efficiency in each case.

As we all know, there are a number of Naphtol combinations that cannot be handled satisfactorily under the best conditions, and for this reason it is well for a dyer to check carefully each combination before any attempt is made to dye the formula selected for the continuous process.

Starting with the first vital point in the application of these colors, a properly designed pad plays a very important part in the final results obtained. By the use of a pad constructed as shown, Naphtol combinations that vary largely in their degree of exhaustion can be run together with a minimum amount of trouble. This pad is so designed that material can be run either straight through the nip or immersed under a small roll, when necessary. The use of large rolls seems to give better results from two standpoints. First, it is easier to maintain a proper set; and, second, better squeeze effects are produced, eliminating the possibility of bowing the roll, which in a great many cases brings about the hazard, on heavier fabrics, of dyeing heavy centers. As the proper squeeze effect on the pad governs the efficiency of drying, it is, therefore, desirable to deliver, from the pad, cloth containing a minimum amount of moisture. With a properly designed pad, it is possible to work with squeeze effects as low as 60 to 65 per cent, depending on the construction and absorption of the material.

Using a pad of this construction, we have been able to pad evenly, without any exhaust, by running the material through the nip; such combinations as Naphtol AS shaded with AS-SR being an example of the use of two products which differ from each other to extreme points of exhaustion in this class of colors.

Having the most suited mechanical equipment at our disposal, as a means of controlling exhaust, our next concern is the control of pad liquors with regard to stability of mixes.

From our practical observations, we have found padding at high temperatures around 200° F. to be very beneficial in keeping heavy concentrations of Naphtols in solution.

It might be well at this point to mention the use of some of the assistants in pad liquors, and the function of these products in the mix.

ANIMAL GLUE

This product has a stabilizing action on the solutions and aids in keeping down foam; however, if too much is used on fabrics that are hard to penetrate, the effect of glue will be noticeable in holding off the developing liquors, causing poorer penetration. Where glue is used, a sort that is lime free must be selected as the stability of the pad mix is easily affected if lime salts are present.

USE OF PENETRANTS IN PAD LIQUORS

We recently have made tests on certain constructions of material and observed that although penetrants were not necessary as an aid in the padding of the Naphtol itself, as Naphtols have excellent penetrating properties, these penetrants assisted greatly in the cold developing liquors by making the goods more receptive for the bases and color salts.

As we needed a penetrant that would stand high padding temperature, we found Humectol CX to be the most efficient for this purpose.

SULFONATED CASTOR OILS

These products should not be underestimated for the part they play in Naphtol dyeing, as they offer an excellent medium for stabilizing mixes; their only drawback

*Presented at Annual Meeting, Atlanta, Ga., December 2, 1938.
**General Dyestuff Corp.

being their foaming properties, and with their use it at times becomes necessary to employ pine oils to keep down the foam on high speed pads.

ALCOHOLS FOR DISSOLVING

A number of Naphtols require a solvent in the nature of an alcohol, and as they vary in their reaction to the various solvents used, we have found the most suited all-round product for this work to be Cellosolve, especially when working at high pad temperatures.

EUNAPHTOL AS

By checking over the assistants mentioned, they all have their place in Naphtol padding, and in order to simplify pad formulas Eunaphtol AS was developed a few years ago. With this product it is possible in most cases to eliminate glue, Humectol, sulfonated castor oil, pine oil, and use instead only the one product, Eunaphtol AS.

NAPHTOLATES

A marked step forward in the advancement of better products, for ease of handling, are the Naphtolates. By the use of these Naphtols very stable solutions are obtained without the necessity of dissolving with solvents.

These products are water soluble and go into perfect solution without the aid of additional caustic or any other medium.

DRYING

The next important step in the dyeing of Naphtols continuously is the use of proper drying equipment. Dry cans for this operation are not very efficient. Various types of hot flues have been used for the drying of naphtolated material but it has not been until recently that a balanced unit has been designed to give the desired results for continuous operation.

The most efficient hot flue we have found to date is the Andrews and Goodrich Naphtol Vapor Dryer. A considerable amount of work has been done during the past few years on the proper drying of materials, and colors to be used in conjunction with this vapor dryer.

As these dryers vary in design and size to suit various ranges of materials and plant conditions, a great deal of care must be taken in the selection of units most suited for the work to be handled at any given plant. The success of the continuous operation of these colors has been largely due to the development of this vapor dryer.

These machines can be equipped with temperature controls and we now are in a position to regulate this part of our dyeing which in the past has caused considerable trouble.

It is well known that all Naphtols vary in their chemical structure, solubility and dyeing behavior. They also have similar peculiarities with regard to drying; however, they dry without migrating according to their degrees of substantivity, Naphtol AS being the least substantive, and Naphtols AS-SR and AS-SG the best in this respect.

Our fabrics play an important part in drying, and the absorption and construction of the goods may determine whether or not a non-substantive Naphtol may be dried without migration. Light constructions of print cloths, such as 60x48 and 64x60 unmercerized, are very hard fabrics to dry with non-substantive Naphtols, without showing some signs of color migration.

By mercerizing these same fabrics, which helps hold the color in the goods, these constructions can be dried without difficulty. The more absorbent the material and the more evenly it is woven, the less trouble we have from colors that are hard to dry. Common salt additions to the pad liquors are helpful in this respect. However, utmost care should be used in adding salt to pad mixes that contain a high concentration of Naphtol as such additions affect the stability of these solutions.

Lower drying temperatures and skying before the material enters the vapor dryer will also assist in overcoming troubles of this nature on fabrics that are sensitive to drying.

Drying troubles, of course, are accentuated when we are confronted with a very light, open, and uneven weave that has to be dyed with a non-substantive Naphtol.

This vapor dryer is so constructed that the migration does not take place from back to face but shifts to the uneven places in the fabric. We have seen only a very few cases where troubles of this nature could not be overcome, and we consider that, to date, we have made considerable progress in the drying of Naphtols on all types of cotton fabrics.

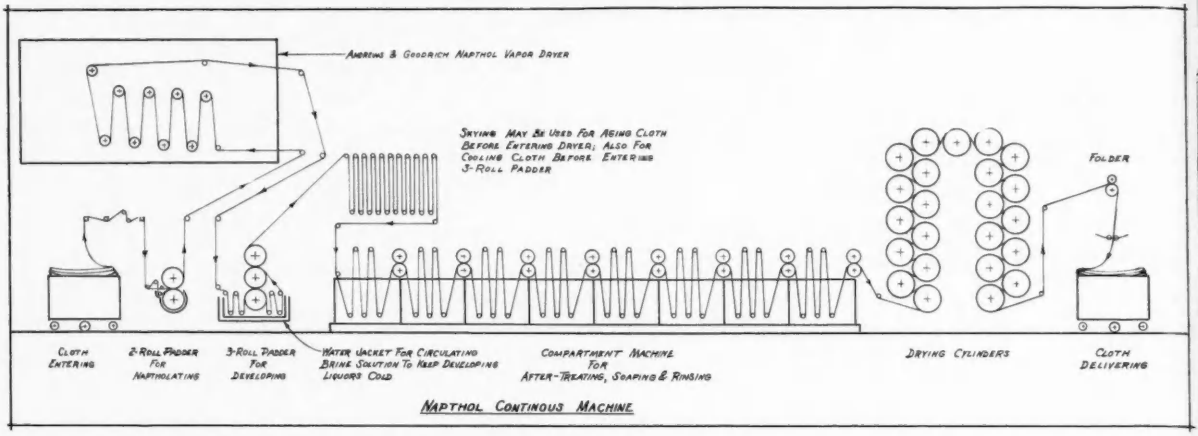
Following the drying operation, the goods enter the developing bath of either fast color salts or bases. At this point we are confronted with the most important factor in the application of these colors, as we are working with solutions that are not very stable, and it becomes necessary to exercise the utmost care in watching this part of our dyeing.

We believe the most satisfactory equipment for this purpose is the three-roll pad, utilizing a dye bath as small as possible, maintaining a slight overflow to wash off any Naphtol precipitates that form on the surface.

As the temperature must remain low with the majority of the developers, a refrigeration unit should be installed to keep the liquors cold at this point. Low temperatures assist greatly in stabilizing these baths, and when ice is used where this equipment is not available, we are faced with the problem of dilution. During summer months when large quantities of ice become necessary with certain bases, we are working with a dilution problem difficult to control.

Our first indication of dilution troubles is always evident by a close determination of the patches off the machine. These patches will show a slightly inferior penetrated dyeing, as the run progresses, this being caused when large quantities of ice melt in the developing liquors weakening the concentration of these baths.

The other important factor along with temperature in


Andrews & Goodrich Naphtol Vapor Dryer
Skying May Be Used For Aging Cloth Before Entering Dryer; Also For Cooling Cloth Before Entering 3-Roll Padder
Folder
Cloth Entering
2-Roll Padder For Naphtolating
3-Roll Padder For Developing
Water Jacket For Circulating Brine Solution To Keep Developing Liquors Cold
Compartment Machine For After-Treating, Soaping & Rinsing
Drying Cylinders
Cloth Delivering
Naphtol Continous Machine

the control of this bath is the one of proper pH. When using developers that will stand the use of acetic acid as an alkali binding medium, this factor can be easily controlled. However, it is not feasible to use acetic acid with a number of the developers and in these cases we must resort to the use of Eulysine AS, a product which has the property of binding the caustic soda carried over from the prepared material and at the same time does not hurt the color value of the coupling agents. This product is mainly used on such developers as the Fast Blue B, Fast Blue BB, Fast Violet B and the Variamine Blues.

After leaving the developing pad, sufficient time must be allowed for complete coupling of the developers. This is accomplished by utilizing a sufficient number of sky rolls. Adequate skying at this point increases the flexibility of the machine and the number of rolls used should be figured to allow sufficient time for the slowest coupling combination.

AFTER-TREATMENT

We now are in the process of ascertaining the best medium to use in the first box, following the goods as they leave the sky rolls.

From recent tests that have just been completed we have found our best after-treatment to be one of entering the goods into plain boiling water. This plain boiling water has the effect of completing the coupling of the developers, producing brighter and fuller shades in the cases where we have made trials to date.

A precautionary measure must be taken at this point by using a large overflow with a heavy spray on top of the bath in order to wash off the decomposed developers which are precipitated by the hot water. If this is not done, impurities will form a tarry substance that is very difficult to remove from the rollers and will gradually pick up on the cloth in process.

After hot washing the goods, we find it best to after-treat in as many boxes as available, with a boiling solution of Igepon and soda ash. However, we find in a number of cases that a great many shades have to be rope soaped in order to produce the true shade of the combination along with obtaining the desired fastness to crocking.

The sketch shown is what we consider, to date, to be the most suited mechanical equipment for the dyeing of Naphtol colors by the continuous method. This machine, with a few slight adjustments such as acid developing boxes for the coupling of Algosols, can be used to an advantage also for the dyeing of vats, sulfurs, and para colors.

Your Student Section at North Carolina State College and Some of its Problems*

ALBERT H. GRIMSHAW**

THE boys at State College become members of the Student Section by a process of elimination. Of over two thousand students enrolled at the college, about four hundred are in the textile school. As the first two years in this school have exactly the same courses, no matter what the major, freshmen and sophomores are bound to take the same work. No freshman nor sophomores take courses in the Textile Chemistry and Dyeing Department, only juniors and seniors, as well as graduates are in this department. This narrows the number

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**North Carolina State College.

who might join the Student Section. Then again, although students in any of these classes may take courses in this department, only about twenty-five or thirty major in it. From this last group, your Student Section obtains its members.

The first problem of any of the students is found before entering college. It is—"Shall I go to college?" This problem is usually solved by his folks. The next problem is—"Where will I go?" Maybe he goes to his dad's old school, maybe you and some of his other friends help him to decide. Then comes a tough problem which will influence his whole life—"What school or course in the college shall be my major?" That is a great problem, and due thought should be given by you or any other person who helps him to select his life work.

For some reason he may choose textile as most of you here have done. He enters as a freshman and starts his work. Before he goes very far, he and the other freshmen are given a group test for color vision using the Ishihari method of testing. Those showing non-normal vision are advised to have individual tests made as soon as possible.

Before being any time in the junior year, each student MUST take this test. In the past four years, about two hundred and fifty boys have taken the test. Records are kept, and have been kept for the past nine years. Of the boys mentioned, about twenty were slightly off in the reading of the Ishihari figures; about ten were away off from the normal, but in almost every case these students could read the figures not visible to the normal eye. One student this year was the worst in all the tests over the nine years. He was not only advised to drop textile chemistry and dyeing, but really was forced to change his course. Color matching is one of the required subjects which he could *not* have passed, therefore he could not have graduated. So far as known, this is the only time where a student was not allowed to follow his desire as regards choosing a course when he was up in his studies. The other ten students mentioned were warned about their vision being non-normal. All but three of them were taking courses other than textile chemistry and dyeing, and so this non-normal vision of theirs was not considered a big problem. The three remaining, who were taking textile chemistry and dyeing, were also advised of their vision tests, but allowed to continue at their own request. All were given a simple color matching course, and all did very well. Two of these boys are now working in dye labs, the other is with an oil concern. How would you solve this big problem of color vision?

Now comes a problem of choosing a major textile course. All freshmen and sophomores have taken the same courses. Until they enter the junior year they have been deciding which of the following courses they will select: Textile Manufacturing; Textile Management; Weaving and Designing; Knitting; or Textile Chemistry and Dyeing. It is their problem, and here again the faculty only advise. Their folks, and you, their friends can also help them with this problem.

Of the courses taken in their four years; about eighty per cent are required, the other twenty per cent are elective. It is a great problem to select the right electives. Of the elective twenty per cent, he uses up about three per cent if he chooses to take Military Science for two years; if he takes Military Science for four years, he uses up over eight per cent of the twenty leaving only twelve per cent. Of the eighty per cent of required courses, he takes English; Chemistry; Math; Textile Physics; Economics; Dyeing; Textile Printing; Textile Microscopy; Rayon; Finishing; and general Textile courses; Mechanical Engineering; Physical Education; History; Psychology. For electives he can choose from courses given in the other schools in the college. That is his own problem. Will he take an easy course, or will he take some hard course that may be of further use to him in later life? How would you advise him? A curriculum is attached of courses given in textile chemistry and dyeing with the number of hours per term. There are three terms each year. The faculty would like your suggestions as to changes or additions in this set up; do you think the student's problem would be solved by having more math, more economics, more psychology, etc.?

Many of the courses are arranged especially for textile students. For instance in Industrial and Personnel Management, the textile students use the books written for the Textile Foundation as reference books. There is a special course in Physics for textile students. In qualitative chemistry, they use the AATCC Year book methods. In Psychology, Sociology and Decorative Drawing, the textile end is stressed. But the main thought is to give each man a broad training along with his specialty.

The student then gradually has the problem brought before him of using mill equipment or lab. equipment. It is surprising the number of students taking this course who have never been in a mill. At the school, there is such equipment as hosiery dyeing machines; raw stock dyeing and drying; small Franklin and small Hornbuckle package dyeing; extractors; Smith Drum skein dyeing; dye beck; kier; printing machines, etc., in the main labs. In the research lab, there is equipment for pH determination; Soxhlet and Bailey extractors; a variety of microscopes and photomicrographic equipment; viscosimeters; Fade-Ometer; oil testing apparatus; ovens; balances, etc. Naturally, they do not get to using any of these for any length of time. Their problem is to get to know why and how to use them in possibly a theoretical manner; then you can help them in a practical way when they join you in the business world.

One of the best ways in which the above problems are aided in being solved is by their trips to the mills and labs, where they see you older men busily engaged in using the equipment. They get more actual learning from watching you fellows on these inspection trips than they

can from reading and studying books for weeks. It would be fine if you could read the reports that they make out at the end of their trips. In the last few years, visits have been made to bleacheries; commercial dye labs; dye manufacturers; mercerizing plants; print works; hosiery dyeing mills; rayon and cotton dyeing mills; silk finishing mills; finishing compounds manufacturing plants; soap making plants; package dyeing plants, etc. If you have met the boys, you likely have heard them express some of their problems. On their next visit to you, please answer as many of the problems as possible. If you have some problem which you think would be of interest to them to try to solve, just send it along and let them try.

To solve such problems as you might send in, they are given quite an amount of outside reading to do in our own library and in the department office. Each man has to abstract articles, arrange his paper and then lecture to the class. At our library, we are fortunate in having bound volumes of AMERICAN DYESTUFF REPORTER; Textile Colorist; Journal of Textile Institute; Melliand; Rayon Textile Monthly; Cotton; Textile World; and numerous other American and English textile publications: In the department office are reference cards on thousands of articles. If you had to abstract articles and prepare talks, which of the textile journals would you prefer to use in solving the problems?

If problems or tests sent in by mills require practical tests; the students first study the problem and then outline the plan that they think best for solving it. These tests usually require outside reading, and the Year Book has come in handy on many occasions. Some problems sent in are analysis of sizing compounds; identification and photomicrographing of yarns both longitudinally and cross sections (lately of spun rayons); uneven dyeing tests; mildew proofing; fastness tests (find Year Book excellent); desizing tests; finishing compounds; starches and dextrines; wetting out (use Draves Test); some casein wool lately; tests on salts, hydro, etc. Also we have questions like the following: "Can you have an oil without a fatty acid radical?"; quote from letter of a dad to his son—"get data on sulfonated mineral oil in soaking of silk"; "what is used in delustering"? etc. These problems are put up to the boys for study and reporting. If you send in a problem, it can be made easier for the students if you include all details about the problem. If samples are sent, be sure that the sample has been correctly collected. The school likes to have problems sent in by North Carolina mills and will try to solve the problem with the facilities of the school, and by having the student try his hand on the problem.

The Student Section has been fortunate in having had as its guests various friends who came to lecture on their specialties. These guests represented many of the leading dye manufacturers; finishing compounds makers; starch and sizing makers; mills engaged in printing; dyeing; finishing of cotton and rayon; etc. A problem to the students is to gather an understanding of the use of commercial products in a practical way. In school, most of the work is theoretical with just a chance to barely scratch the surface of the practical problems. The speakers were requested to emphasize the use of their own specialties. In this way, some of the theoretical problems which bother the students are cleared up by the speakers who are experts in their line. Salesmen and demonstrators can help the students, their own firms and also themselves by coming as guests of the Student Section to lecture about the products which they sell or demonstrate. The student sees the problem solved as to the name, the appearance, the use, etc., of the substance. The firm gains a possible prospect of the future. The salesman or demonstrator gains a bunch of friends. So come on over and talk to the boys.

Next year the college will have a brand new building for its textile school equipped to help the boys solve some of their problems. But the biggest problem now confronting the seniors is—you have guessed it—GETTING A JOB. These boys feel just as you felt when you looked for your first job. They begin to realize how little they know. Then when they do get the job, their problem letters begin to come in calling for help, or telling about their work. Here are a few quotes—the first from a lonesome boy; "been here three weeks and about fed up with the place." This boy was transferred about 1,000 miles away from his home. Some problem to advise a homesick boy. Here's another: "I want some advice. Every day I realize more and more just how little I do know about dyeing and I want to do something about it." Here's another: "Lab. work is wonderful training and I want a whole lot more of it, but I do hope to get in the mill eventually. What type of mill work would you advise me to try to get into, one using mostly rayon or just cotton?" Here's another: "Unfortunately, I am working under a man who doesn't want to tell any of the young fellows about the work. What is the best way to persuade him to open up?" Here is a booster: "My work is fine, I like it and I believe that is three-fourths of the fight. The boss is an ace gentleman; the firm is a darned good outfit. They pay me well considering my lack of experience." From a boy in a lab: "The knowledge that I gained in college has proved invaluable and helps me a lot. Old Matthews has helped a lot too, for I keep it open a good part of the time." Last one: "For the past while I have been going to the New York Public Library and reading and abstracting articles from current and old issues of trade journals. Do you think this worth while; should I confine my reading to the current journals?"

You have heard some of the problems of the Student Section and now on their behalf, I extend to you, their experienced brothers, a cordial invitation to visit them at any time.

After very careful study taking into consideration that there are many, many subjects which would be of value

if there was time in which to give them, the faculty of the textile school have chosen the following as likely to have the most value for the time available in the four-year courses covering textile education, specifically leading to a degree in Textile Chemistry and Dyeing. Your suggestions are invited.

All textile students take the same courses for the first two years, then the students specializing in textile chemistry and dyeing take work as noted in the junior and senior years.

Explanation of figures etc.; there are three terms; one lecture hour equals one credit hour; two lab. hours equal one credit hour; two hundred and thirty-one credits required for graduation.

FRESHMAN YEAR

Composition, English, 9 credits; Textile Physics, 12 credits; Algebra and Trig, 12 credits; Engineering Drawing, 6 credits; Shopwork, 3 credits; Textile Principles, 6 credits (only real textile subject in freshman year); Military Science or World History, 6 credits; Hygiene, 3 credits, (physical education).

SOPHOMORE YEAR

Economic History, 9 credits; Decorative Drawing or Light in Industry, 3 credits; General Inorganic Chemistry, 12 credits; Cotton and Cotton Classing, 6 credits; Yarn Manufacturing, 5 credits; Power Weaving, 4 credits; Fabric Structure and Analysis, 4 credits; Knitting, 5 credits; Military Science or choice of Economics, Psychology, History, Modern Language, Sociology, 6 credits; Sports Activities, 3 credits.

JUNIOR YEAR

English or German, 9 credits; General Economics, 9; Psychology or Textile Courses, 3; Qualitative and Quantitative Analysis, 12 (includes analysis of textile substances using the Year Book of the AATCC as reference); Dyeing, 12 credits working on elementary dyeing of all fibers including a study of chemicals and assistants used; Elective, 9 (if Military Science is taken for four years, there are no further electives in junior year).

SENIOR YEAR

Industrial and Personnel Management, 9 (using Textile Foundation book as a reference); Organic Chemistry, 12; Psychology or Textile Course, 6; Textile Microscopy, 2; Fabric Testing, 1; Textile Printing, 6; Cotton and Rayon Dyeing, 12; Electives, 12 (usually all seniors elect Textile Finishing, 6 credits for part of this course, as it takes up all problems which can be studied, discussed and worked on in the labs).

One complete term is devoted to Rayon theory and lab. work. In addition to the analysis listed under chemistry, the seniors devote considerable time to study of starches, sizing and finishing compounds. All of above subject to change if better courses can be arranged.

COOPERATIVE RESEARCH ON EVALUATING TEXTILE FINISHES

AT the Annual Research Council Meeting of the A. A. T. C. C. in December at Atlanta, Georgia, under Professor L. A. Olney of Lowell Textile Institute, it was voted to finance a modest research program aimed at evaluating textile finishes. At present, there are no standard methods for determining the stiffness of the cloth, its resiliency, smoothness, draping quality, etc., and all the other physical factors which produce a cloth's "feel" or "handle." To be sure, considerable work has been done between individual mills and their customers and by the Government laboratories, but in view of the basic importance of the "hand" of the goods from a merchandising standpoint, the surface of this problem has hardly been scratched. Of course, a finish is an intangible sort of thing anyhow to describe and hence, a very difficult thing to evaluate, but the textile chemists believe that a start should be made and having pioneered in setting up standards for all kinds of textile testing, they hope to accomplish something of value in this particular line.

Fortunately, the textile laboratory at M.I.T. under Professor E. R. Schwarz, has been working along this same line and has already collected considerable data with instruments which they either bought or built for this purpose. They also have two part-time associates available to continue this work and have the facilities and experience necessary to conduct it successfully. Therefore, in a cooperative agreement signed December 31st by Professor C. L. Norton, Director, Division of Industrial Cooperation, M.I.T., and by Professor Louis A. Olney, Chairman of the Research Committee of the A. A. T. C. C., it was decided to pool their resources on this problem during the coming year. The program will be conducted under the joint direction of Professor E. R. Schwarz and Mr. K. H. Barnard, Chief Chemist of Pacific Mills and Chairman of the A. A. T. C. C. Sub-Committee on this particular subject.

A brief outline of the work proposed includes a resumé of the literature and work done by others on this subject, an investigation of the various instruments in use for measuring those physical properties of textiles which influence its "hand." It is hoped that a study of the psychological factors involved may also be included. If standard test methods and equipment can be agreed upon, it will then be possible to give numerical values to the effect of adding different chemical finishes and resins to a cloth, which is something of paramount interest to the large manufacturers of these materials. It will also be possible by these same methods to give numerical values to the permanency of these finishes in use and after normal cleaning operations which is, of course, of paramount interest to the consumers. Naturally, both points of view are of vital importance to the finishing plant, without mentioning the question of getting the best money value

out of the various softeners and other finishes which they purchase.

This proposed research is therefore, of general interest to every user and maker of textile fabrics and progress reports will be issued as fast as the work done makes them available.

MEETING, SOCIETY OF CHEMICAL INDUSTRY

MEMBERS of the A. A. T. C. C. are invited to attend a meeting of the American Section of the Society of Chemical Industry to be held on February 10th, 1939, at the Chemists' Club, 52 East 41st Street, New York City, at 7:45 P. M. The speaker of the evening is to be Dr. Wanda K. Farr of Boyce Thompson Institute for Plant Research, Inc., who will talk on the subject "Viscose Rayons." A dinner will precede the meeting at 6:30 P. M. to be held in the main dining room. Any members wishing to attend the dinner should communicate with the steward at the Chemists' Club, giving their names and asking that reservations be made.

MEETING, N. C. STATE COLLEGE STUDENT SECTION

A MEETING of the North Carolina State College Student Section was held on Jan. 7, 1939. Two alumni of the Textile School were the guest speakers. Both graduated in 1938.

Mr. F. M. Southerland of Southern Dyers at Burlington, N. C., gave a very interesting talk on color matching and dyeing. He also told us of the dyeing machinery used in the mill.

Mr. T. G. Sloan of the Rock Hill Printing and Finishing Co. at Rock Hill, S. C., gave a very good talk on naphthol dyeing on cotton piece goods and printing.

Respectfully submitted,

S. SCHANDLER, *Secretary.*

MEETING, NORTHERN NEW ENGLAND SECTION

A MEETING of the Northern New England Section was held at the Massachusetts Institute of Technology, Boston, Massachusetts, on Friday, December 16, 1938.

There were sixty members present at the dinner, which was served in the Faculty Dining Room in the Walker Memorial. Following the dinner, Dr. Olney, President Emeritus of the A. A. T. C. C., gave an interesting account of the recent national convention in Atlanta, Georgia. After a short business meeting the group repaired to the Eastman Building where a very interesting lecture entitled "A Decade of Color Measurement" was presented by Dr. A. C. Hardy, of the Massachusetts Institute of Technology faculty.

Dr. Hardy described the development of the Hardy Recording Spectrophotometer during the past ten years, and we were privileged to see the latest improved model in operation. Dr. Hardy, in his lecture, also quite clearly explained the development of the physical basis of color specification associated with the use of the Spectrophotometer. Some commercial applications of such color specifications used at the present time were noted, and inferences of textile applications were suggested by Dr. Hardy. There were over 100 people present at this lecture and no doubt everyone was impressed with the idea of thinking of color as a definite mathematical concept unaffected by physiological or psychological influences.

Respectfully submitted,

JOHN N. DALTON, *Secretary.*

CALENDAR OF COMING EVENTS

Meeting, New York Section, Chemists' Club, New York, N. Y., January 27, 1939.

Meeting, South Central Section, Read House, Chattanooga, Tenn., January 28, 1939.

Meeting, Piedmont Section, The Poinsett, Greenville, S. C., February 11, 1939.

Annual Meeting, Inter-Society Color Council, New York, N. Y., Feb. 23, 1939—Details were announced on page P17, January 9, 1939 issue.

Nineteenth Annual Meeting and Convention to be held under auspices of Northern New England Section in Boston during 1939. Date and headquarters to be announced later.

COMPLETE STENOGRAPHIC REPORTS OF

Technical Papers, Discussions, and Addresses delivered at the Eighteenth Annual Meeting will be published in future issues of the Proceedings.

SOUVENIR BANQUET MENU

Copies of the souvenir menu of the Annual Banquet at Atlanta are available upon request to Robert W. Philip, 1020 Grant Bldg., Atlanta, Ga.

TRADE NOTES • NEW PRODUCTS

• JOINS COMMONWEALTH

Mr. Chas. M. Robbins, formerly connected with the Phoenix Hosiery Co. as dyer of silk and mercerized hosiery and cotton yarns, has joined Commonwealth Color & Chemical Co. as sales representative and demonstrator. Mr. Robbins will be connected with Commonwealth's Chicago office and travel in the middle west.

• REICHHOLD CHEMICALS APPOINT FIVE DISTRICT MANAGERS

At the January meeting of their board of directors, Reichhold Chemicals, Inc. (formerly Beck, Koller & Company, Inc.) of Detroit, Michigan, promoted five of their representatives to managerships of their respective territories.

The newly appointed district managers are G. A. (Gus) Olson, Philadelphia; Wm. J. (Bill) Deeks, Cincinnati; R. H. (Bob) Coerdt, Cleveland; M. W. (Bob) Reece, San Francisco; and F. E. (Frank) Dillon, Los Angeles.

In addition to supervising the sale and distribution of RCI synthetic resins in their respective territories, Messrs. Olson, Deeks, Coerdt, Reece and Dillon will also handle the sale and distribution of the Lavanburg line of chemical pigments in the districts named.

• NEW TEXTILE BUILDING

Another phase of State College's $1,600,000 building program occurred January 16 with the opening of bids for construction of a new textile building designed to be the most modern of its type in the South, Ross Shumaker of the Department of Architecture has announced.

Estimated cost of the building, which will face Hillsboro Street on the extreme western edge of the campus, is $350,000.

Actual construction of the new building is expected to begin shortly after the contract is let. Workmen already are clearing the site and preparing for foundation excavation.

The new textile building will be four stories high and will conform architecturally with other buildings in the rapidly growing west section of the campus. It will contain approximately 75,000 square feet of floor space. The building now in use contains about 50,000 square feet.

• PHOENIX RELEASES

Phoenix Color & Chemical Co., Inc., 24 Van Houten Street, Paterson, N. J., announce release of the following products:—

Benzaphen Blue 2 G N—a new direct color said to be fast to B.O.N. development and to be particularly useful for dyeing navies on acetate and viscose rayon mixed goods. Properties claimed for this product are as follows: economy; very fine appearance under artificial light; very little change in shade on development with B.O.N.; excellent penetration; fastness to ironing and alkali. The product is also recommended by the manufacturers for dyeing navies and medium blue shades direct on rayon and vegetable fibers. The color is said to be very economical for this type of work.

Benzaphen Brown 2 B N Conc.—a new product for dyeing rayon and cotton. This is said to be an inexpensive direct yellow-brown which is fast to acids and alkali and to possess better light fastness as well as better level-dyeing properties than the average brown of this type.

• GENERAL RELEASES

General Dyestuff Corp., 435 Hudson St., New York, N. Y., announces release of the following color card and circulars:—

Algosol Pads on Shirtings—a new card illustrating the types of shades which are usually dyed on colored yarn fabrics for the shirting and dress goods trade and will be of considerable interest due to the fact that the swatches were taken from practical runs. Until the introduction of the Algosol dyestuffs, the dyeing of ground shades on colored yarn fabrics had been done with vat dyestuffs according to the reduced padding method. It is stated that the normal fastness to washing could not be obtained by this method due to the fact that it was impossible to conduct subsequently a re-reduction operation for fear of the colored yarn effects bleeding. It is claimed that the Algosol dyestuffs, on the other hand, yield shades of superior fastness to washing than vat dyestuffs applied by the method referred to. Card S. 5569.

Fastusol Red L 4 B L—a homogeneous, direct dyestuff said to be distinguished by its bright shade and very good fastness to light. It is claimed that the color is easily soluble, levels well, possesses good fastness to water, which can even be improved by aftertreatment with Solidogen B, [illegible] is easily dischargeable to a clear white. It stains wool and silk but slightly from a neutral bath and leaves acetate rayon clear. Circular I. G. 1564.

Fastusol Yellow R K—a dyestuff said to be of very good affinity even at very low temperatures and without the addition of salt, and therefore of particular interest for the dyeing of spun and staple rayons and of mixed fabrics of these fibers with cotton. It is stated that the product levels very well and is therefore particularly valuable in combination dyeings; it is further said to be well suited for unions of wool and cotton or of silk and cotton. Circular I. G. 1559.

• JACOB BLOCH RETIRES

After a career of nearly half a century as a seller of colors to the paint trade in the Chicago district, Mr. Bloch has retired from active service. His calls on color buyers in the Windy City territory began long before the turn of the century and during the years he became widely known and well liked. His friends in the trade are legion and all of them will be glad to know that he can now take a hard-earned and much-deserved rest.

The sale and distribution of the Lavanburg line of colors will hereafter be supervised by Mr. George E. Cortiss, who worked with Mr. Bloch in the Chicago area for some twelve or thirteen years.

Organization of a nation-wide sales staff has not yet been completed and the following, therefore, is only a partial list of the Lavanburg sales agents and representatives for 1939. The complete list will appear in a later issue.

BOSTON, MASSACHUSETTS
N. S. Wilson & Sons, Inc.
150 Causeway Street
Telephone: CApitol 5010

CHICAGO, ILLINOIS
Mr. George E. Cortiss
7040 Calumet Avenue
Telephone: ABerdeen 0427

CINCINNATI, OHIO
Mr. Wm. J. Deeks
717 First National Bank Bldg.
Telephone: MAin 1649

CLEVELAND, OHIO
Mr. R. H. Coerdt
642 Terminal Tower Building
Telephone: PRospect 7399

ILLINOIS (except Chicago)
Mr. W. W. Klug
1624 North 69th Street
Wauwatosa, Wisconsin
Telephone: BLuemound 1061

KANSAS CITY, MISSOURI
Abner Hood Chemical Company
507 North Montgall Avenue
Telephone: VIctor 3621

NEW YORK, NEW YORK
Fred. L. Lavanburg Company
105 Bedford Street
Brooklyn, New York
Telephone: EVergreen 8-4640

PHILADELPHIA, PENNSYLVANIA
Mr. G. A. Olson
1700 Walnut Street Building
Telephone: PEnnypacker 0250

PITTSBURGH, PENNSYLVANIA
Mr. Homer D. Butts
Grant Building
Telephone: ATlantic 7680

ST. PAUL-MINNEAPOLIS
L. A. Moore & Company
740 Vandalia Street
Telephone: NEstor 1433

WISCONSIN
Mr. W. W. Klug
1624 North 69th Street
Wauwatosa, Wisconsin
Telephone: BLuemound 1061

• JOIN QUAKER

Dr. Henry H. Gilmann of Brooklyn, New York, has joined the Research Staff of Quaker Chemical Products Corporation, of Conshohocken, Pa.

Dr. Gilmann has his B. S. in Chemistry from Fordham University; his M. A. in Colloidal Chemistry from Stanford University on Scholarship; his Ph.D. in Physical Organic Chemistry from Duke on Scholarship and a Fellowship from the Massachusetts Institute of Technology.

For over five years Dr. Gilmann was Chief Chemist with The City Chemical Corporation of New York City on organic synthesis and development; about one year with Glyco Products, Inc., of New York City as Technical Director.

Dr. Gilmann will confine his work to leading technical development in resin finishes of all types, organic detergents, wetting agents and other organic synthesis, serving the textile and metal industries.

Mr. Robert Zametkin of Brooklyn, New York, has joined the Technical Development Staff of the Quaker Chemical Products Corporation. Mr. Zametkin is a graduate of Columbia University with a B. S. in Chemistry and has spent four years in charge of the Laboratory and dyeing at the Pilgrim Piece Dye Works; was in charge of finishing for some while at the Antipyros Company and later was Plant Chemist with the Congress Piece Dye Works of Paterson, N. J.

Mr. Zametkin will devote his time to the practical development of products created in the Laboratory and at the same time will act in a technical capacity servicing the trade in the Metropolitan area.

• TRAINING IN WRITING

Needs of the worker in special fields for proper organization of his material and for an approved writing style to meet the requirements of technical and trade publications are answered in a home-study course, Composition of Technical Papers, offered by the Extension Division of the University of Wisconsin, Madison. The course is given as a helpful means of acquiring excellence in writing under guidance, without interruption to the daily occupation, and is available to individuals anywhere.

In making the course known to such workers, the Extension Division points to the need felt by many active technicians for greater proficiency in writing articles for publication, as well as business letters and reports. In the assignments the student is introduced to an effective professional style, the planning and arrangement of technical papers, the important points in paragraphing, punctuation, capitalization, abbreviation, proof-reading, and other phases of efficient writing in a specialized field.

The assignments provide practice in writing expositions on topics arising in the student's own line of work, so that the training he receives becomes immediately applicable to his professional needs.

• AWARDED PERKIN MEDAL

The Perkin Medal for 1939 was presented on January 6th to Dr. Walter S. Landis, Vice President of the American Cyanamid Company, at a joint meeting of the American Section of the Society of Chemical Industry and the American Chemical Society, held at The Chemists' Club, New York City. Mr. Victor G. Bartram, President of the Society, presided over the meeting. Dr. Wallace P. Cohoe, Chairman of the American Section, opened the program with a commemoration of former medallists. After a talk on Dr. Landis, the man, by Mr. Floyd Parsons, and a talk on the scientific accomplishments of the medallist by Dr. C. M. A. Stine, the medal was presented to Dr. Landis by Professor Marston T. Bogert. After the presentation Dr. Landis gave his medal address entitled "Argon," in which he reviewed the factors leading to the development of a process for producing argon.

Dr. Landis was born in Pottstown, Pa., in 1881 and received his elementary education in Pottstown and Orlando, Florida. He received the metallurgical engineering degree from Lehigh University in 1902, the degree of Master of Science from the same institution in 1906, and honorary degree of Doctor of Science from Lehigh in 1922. He held various teaching positions at Lehigh, mainly in the field of metallurgy, and then became Chief Technologist of the American Cyanamid Company in 1912. He has been Vice President of that company from 1922 to date. His principal contributions to industry include processes for the production of cyanamid, the first to oxidize ammonia commercially in the United States, originator of the Ammo-Phos process, cyanide from cyanamid, process for producing urea, first commercial production of argon, contributions to the explosive industry, electric furnace studies, etc.

Dr. Landis was President of the Electrochemical Society in 1920, Chairman of the New York Section of the American Chemical Society in 1931 and Joseph W. Richards Memorial Lecturer of the Electrochemical Society in 1934. He is a member of The Electrochemical Society, American Chemical Society, American Institute of Chemical Engineers, American Institute of Mining & Metallurgical Engineers, Tau Beta Pi, Sigma Xi and Epsilon Chi. He has published many articles, textbooks, and has been granted many patents in the United States and foreign countries.

CLASSIFIED

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

POSITION WANTED: EXECUTIVE — Fifteen years' experience as manager of large textile dyeing and finishing establishment. Conversant with all phases of the business. All types of fabrics handled. Open for a connection where my trade connections and knowledge will be of value. Write Box No. 167, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: Textile chemist, 33 years of age, married. Textile Chemistry and Dyeing Course, Lowell Textile Institute. 11 years' experience in leading dyeing, printing and finishing plants. Knowledge of textile chemical and dyestuff testing, as well as process development and control. Available immediately due to liquidation of former employers. Write Box No. 166, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.